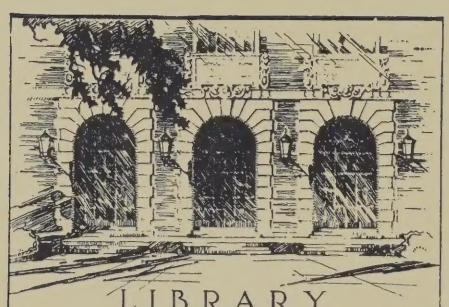

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INTRODUCTION.

The problem of nutrition assumes many different aspects according to the angle from which it is approached. From the physiological point of view the problem may be subdivided as follows: (1) What are the organic requirements, and (2) what is the best method of meeting these requirements, that is to say, the most economical method of consumption from the standpoint of physiology ? Another aspect of the problem of nutrition is the economic one. Regarded from this angle, the problem may also be subdivided as follows: (1) The production of articles of food, and (2) the manner in which these articles may be most profitably utilised in conformity with the economic resources of each country.

The fault to be found with most enquiries which have hitherto been conducted into the problem of nutrition is that they have not taken into account the interdependence of these two aspects, and have endeavoured to discover a solution from one point of view only. A moment's reflection will, however, suffice to convince us that the problem can receive a satisfactory solution only if the method of physiological utilisation (*i.e.*, consumption), selected as most advantageous from a physiological point of view, is also the most advantageous from the point of view of national economy.

Unfortunately, even supposing that some ideal solution be discovered which fulfils these two conditions, the solution might be rendered illusory by a third and not less important aspect of the problem — the social aspect. It is theoretically possible, and indeed it happens too often, that even when the problem of nutrition has been satisfactorily solved — as regards the above conditions — it is materially impossible to meet the food requirements of a whole social group, owing to the well-known fact that in most organised human communities there are poor as well as rich individuals.

The determination of food requirements and the most effective methods of satisfying these requirements from a physiological point of view will not, even if the method also happens to be the best one from the point of view of national economy, suffice to eliminate the phenomenon of hunger. Certain articles of food which from the standpoint of physiology and national economy are entirely satisfactory, are often so expensive as to be inaccessible to the masses. A scientific working plan which would make it possible to arrive at a real solution of the problem of nutrition should therefore have three main objects in view:

(1) To determine what natural products can satisfy food requirements, and then select those the consumption of which would be most advantageous from a purely physiological point of view;

(2) To select from the latter group the substances which best meet the requirements of national economy; and

(3) Proceed, in this last group, by selection based on social considerations, to draw up a " food code " which, though it may not be perfect, will, under existing social conditions, be the nearest approach to perfection we can attain.

The State Institute for the Study of Nutrition, which was founded at Tokyo in December 1920, and of which I was appointed Director, proposes to conduct researches on these lines. The Institute includes four departments, organised as follows:

Department I: Theoretical Study of the Science of Nutrition:

Section 1: Alimentary chemistry.
Section 2: Metabolism.
Section 3: Physiology and pathology.
Section 4: Miscroscopy.
Section 5: Physics.

Department II: Practical Study of the Science of Nutrition:

Section 1: Study of foodstuffs:

(*a*) Natural products (including substitutes employed in time of famine);
(*b*) Food industries;
(*c*) Research with a view to the discovery of new foodstuffs, animal or vegetable.

Section 2: Cheap food.
Section 3: The preservation and distribution of foodstuffs.
Section 4: Kitchen and table utensils.
Section 5: The feeding of infants.
Section 6: The utilisation of refuse.

Department III: Research Work:

Section 1: Statistical and historical studies.
Section 2: Practical courses in nutrition; exhibitions and propaganda.

Department IV: Central Services:

Section 1: Staff, correspondence, etc.
Section 2: Supplies and accountancy.

This Institute is no case of spontaneous growth. On the contrary, it is the last link in the long chain of effort made by generations of Japanese scientists. Japan as a country is relatively small and poor; the question of her food supplies has at all times been an agonising problem for statesmen and hygienists alike. At certain times, for instance during the Tagukawa period, the population of its own accord endeavoured to remedy the situation by voluntarily limiting the number of births; for the last fifty years, however, there has been no sign of this tendency.

In the past, Japan was entirely dependent on food supplies from abroad and

famine with all its consequences was of frequent occurrence; but, during the last fifty years, the modern development of the country, its agriculture and industry, has to a large extent rendered it independent of foreign supplies, and food conditions have considerably improved. At the present time the food resources of the country consist of 400 varieties of common foodstuffs, to which must be added about 500 varieties of foodstuffs which can be employed in time of emergency. All these foodstuffs—those which are commonly used by the people and those which it would seem need only be used in exceptional circumstances — should be studied from the point of view of their chemical composition, their production and improved methods of utilisation if the country is to be spared the privations it has endured in the past.

It is, indeed, this urgent need to ensure regular food supplies which has stimulated the great efforts, both in pure and in applied science, of Japanese scientists, such as Professor Osawa, of the Imperial University of Tokyo; Dr. Tawara, of the Ministry of the Interior's Station of Experimental Hygiene; Dr. Mori and Baron Takagi, who have devoted their energies to improving the food supply of the army and the fleet; Professors Oshima, Suzuki and Tsuzuki, and many others.

The present volume consists of the work of Japanese scientists in the various institutions of the country, particularly the State Institute for the Study of Nutrition, of which I have the honour to be Director. I have selected from among these works those which are of general utility and, I venture to hope, of a scientific interest outside the narrow limits of our land. These works represent a part of what is best in Japanese scientific contributions to this subject.

Tokyo, December 1926. Saiki.

* * *

To give an idea of the diversity of the work undertaken, I quote about a hundred records of research work published during the last few years.

"Studies on the Basal Metabolism of the Japanese" — By Seizaburo Okada. "Nihon no Ikai", 1923.

"Studies on the Basal Metabolism of the Japanese" — By M. Yasutake. Bull. Med. Coll. Kyushu Imp. Univ., 1924.

"Basal Caloric Requirement of the Japanese" — By Hideo Takahira. Report of the Imp. State Inst. for Nutrition, 1925, Vol. 1, No. 1.

"The Measurement of the Body Surface Area of the Japanese" — By Hideo Takahira. Report of the Imp. State Inst. for Nutrition, 1925, Vol. 1, No. 1.

"Basal Metabolism and the Measurement of the Body Surface Area of the Korean" — By M. Ito and Collaborators. Reported at the meeting of "Chosen Igakkwai", 1925.

"Biological Value of the Main Japanese Food Materials" — By K. Furumi. Mitteil. Med. Ges. Tokio, 1925.

"Studies on the Variation of Metabolism according to Sex" — By S. Sakamoto. "Chu-gai Iji-shimpo", 1921.

"On the Excretion of the Nitrogenous Constituents of the Urine, and Acidosis during Fasting" — By S. Kitakawa. Report of the Imp. State Inst. for Nutrition, 1925, Vol. 1, No. 1.

"Nitrogen and Reducing Substance in Normal Urine of the Japanese" — By K. Takahashi. Mitteil. Med. Ges. Tokio, 1923.

"Intermediary Metabolism of Amino Acids" — By Y. Kotake. "Nis'shin Igaku", 1925.

"Metabolism of Purin Bodies" — By M. Kikuchi. Jour. of Biochem. (Japan), 1923.

"Studies on Perspiration, especially Nitrogen and Chlorine Content of the Normal Japanese" — By K. Inouye and S. Imai. Juzen Kwai Med. Jour., 1924.

"Relationship between the Liver and the Metabolism of Fats" — By T. Higuchi. Keio Med. Sci., 1924.

"Influence of Carbohydrate on the Metabolism of Protein and Fat"— By N. KAGEURA. Jour. of Biochem. (Japan), 1922.

"Hyperglycemia due to Diet in Normal Adults Under Normal Living Conditions" — By Y. SAKAGUCHI. Jour. of Biochem. (Japan), 1922.

"Studies on the Enzymes of Unpolished Rice (Successive Report)" — By K. Aso and T. NAGOSHI. Jour. Sci. Agric. Soc. (Japan), 1925, No. 237, page 91.

"Studies on the Digestibility of Starch" — By S. SUZUKI. Jour. Agric. Chem. Soc. of Japan, 1925, Vol. 1, page 410.

"Chemical Studies of Rice in Different Grades of Polishing" — By T. HIGUCHI, M. KONDO, M. HARA, S. NARITA, and K. MATSUZAWA. Far. E. T. M. As'sn, 1925.

"Studies on Oxidase of Rice" — By Taro HIGUCHI. Reported at 13th meeting of Imp. State Inst. for Nutrition, 1924.

"Investigation of the Chemical Nature and Nutritive Value of Buckwheat" — By M. HARA. Jour. Agric. Chem. Soc. of Japan, 1925, Vol. 1, page 896.

"Nutritive Value of Fats and Lipoids" — By K. TAKAHASHI. Report I, II, III. Jour. Chem. Soc. of Japan, 1922, Vol. 43, page 201; 1923, Vol. 44, pages 547, 574.

"Nutritive Value of the Protein of Buckwheat" — By Y. MATSUYAMA. Jour. Chem. Soc. of Japan, 1923.

"On the Nutritive Value and the Constituents of Kaoliang" — By J. KIMURA. Jour. Chem. Soc. of Japan, 1921, Vol. 42, page 163.

"Chemical Nature of the Amino Acids of Polished Rice" — By K. KUROSAWA. Jour. Chem. Soc. of Japan, 1921, Vol. 42, page 163.

"Determination of Diamino Acids of Polished Rice and Its Polishings" — By K. KUROSAWA. Jour. Chem. Soc. of Japan, 1920, Vol. 41, page 420.

"Determination of Diamino Acids in the Protein of 'Tofu' and Frozen 'Tofu'" — By J. KIMURA, Jour. Chem. Soc. of Japan, 1920, Vol. 41, page 413.

"On the Properties of the Thio-sugar Isolated from Yeast" (Successive Report) — By U. SUZUKI and T. MORI. Jour. Agric. Chem. Soc. of Japan, 1925, Vol. 1, page 653 (The First Report, *ibid.*, page 127, and Bioch. Z., 1924, Bd. 278, S. 154).

"Formation of Alcohol in Animal Bodies" — By M. AOKI. Hokkaido Med. Jour., 1924.

"Relationship between the Metabolism of Fats, Calcium and Magnesium" — By T. INOUYE. Mitteil. Med. Ges. Tokio, 1923.

"Excretion of Mineral Salts during Fasting" — By H. TAKAHIRA, M. KONDO, S. KITAGAWA M. HIGUCHI, S. TANAKA, E. ISHIBASHI, and S. KAYANO. Report of the Imp. State Inst. for Nutrition, 1925, Vol. 1, No. 1.

"Caloric Requirement of Labourers during a Working-Hour in Various Occupations" — By K. TAKAHASHI. "Fatigue and Efficiency" (A book in the Japanese language), 1925.

"Basal Metabolism of Common Labourers" — By H. TAKAHIRA, S. KITAGAWA, E. ISHIBASHI and S. KAYANO. Report of the Imp. State Inst. for Nutrition, 1925, Vol. I, No. 2, 1925.

"Influence on the Body of Long Running" — By T. SAKAI and H. SUNADA. Chiba Med. Jour., 1924.

"Influence of Interruptions upon the Metabolism of Sleeping People" — By T. NARAKA. Jour. Biochem. (Japan), 1925.

"Influence of Mental Work on the Caloric Requirement" — By H. TAKAHIRA. Reported at the Annual Meeting of the Japan Physiological Ass'n, 1925.

"Basal Metabolism of Beri-beri Patients" — By S. OGATA. Jour. Internal Med. Soc. of Japan, 1924.

"Basal Metabolism of Beri-beri and Avitaminosis Patients" — By K. YANAGI. Beri-beri Investigation Ass'n (Japan), 1925.

"Metabolic Changes of Men fed on Polished Rice" — By K. OTA, Keio Med. Sci., 1924.

"Metabolism of Birds Suffering from Vitamin Deficiency" — By K. NAKAMURA and J. YOKOTA. Keio Med. Sci., 1925.

"Basal Metabolism of Diabetic Patients" — By S. OKADA. Jour. Internal Med. Soc. of Japan, 1924.

"Parkinsonism and Basal Metabolism" — By T. ODA and Collaborators. "Kyoto Igaku Zasshsi", 1925.

"On the Behaviour of Proteases on Amylases, with Special Reference to the Chemical Nature of Amylases" — By Shokichi KATO. Jour. Agric. Chem. Soc. of Japan, 1925, Vol. I, page 937.

"Studies on the Carbohydrates of Soy Bean and Its Relation to the Brewing of 'Shoyu'" — By M. YUKAWA. Jour. Chem. Soc. of Japan, 1917, Vol. 38, page 318.

"Biochemical Studies of Rice" — By T. TADOKORO and Collaborators. Reported with different subjects (protein, starch, mineral substances, oil, etc.) in Jour. Coll. Agric., Hokkaido Imp. Univ., 1923, Vol. 13; Jour. Sci. Agric. Soc. of Japan, 1925, Nos. 266-271; Jour. Agric. Soc. of Japan, Vols. 1-2.

"Metabolism in Cancer Tissues" — By Y. OKAMOTO. "Nis'shin Igaku".

"Survey of the Nutritional Condition of The Tokyo Orphanage" — By Y. KOHARA and Collaborators. Mitteil. Med. Ges. Tokio, 1922.

"Studies on the Metabolism of Japanese Women Labourers" — By S. SAKAMOTO. Osaka Med. Ass'n Jour., 1922.

"Metabolism of Girl Students" — By S. SAKAMOTO. Osaka Med. Ass'n Jour., 1922.

"Improvement of the Nutritional Condition of Weak School-Children" — By T. KAWAKAMI. "Tokyo Iji Shinshi", 1923.

"Investigation of Food Materials of Large Cities" — By K. FUJIWARA. "Kokumin Eisei", 1924.

"Investigation of the Nutritional Condition of Aged Japanese People" — By Y. HORIUCHI. Mitteil. Med. Ges. Tokio, 1923.

" Studies on Metabolism of Aged Men and Labourers ";
" Studies on Metabolism of Middle-School Boys and Self-supported Students ";
" Studies on Metabolism of School-Children ";
" Studies on Metabolism of Kindergarten Children " —
By S. Sakamoto. " Chugai Iji Shinpo ", 1923.

" Nutritive Value of the Soldier's Diet " — By T. Okada. Army Med. Jour., 1923.

" Investigation of the Food of the Navy " — By Y. Sakaguchi. Bull. Naval Ass'n (Japan), 1922.

" Studies on the Composition of Fish Muscle " — By U. Okuda. Jour. Sci. Agric. Soc. of Japan, 1919, No. 200.

" On the Nutritive Value of Synthetical Fats containing Fatty Acids of Uneven Number of Carbon Atoms " — By J. Ozaki. Jour. Agric. Chem. Soc. of Japan, 1926, No. 2.

" On the Influence of Various Ratios of Sodium and Potassium upon the Growth of Animals " — By R. Sasaki. Jour. Agric. Chem. Soc. of Japan, 1925, Vol. 1, page 64 (English).

" Influence of Vitamin Deficiency, and Protein Deficiency upon Anti-body Formation " — By T. Nishi. Jour. Bioch. (Japan), Vol. 19, 1925.

" Relation between the Lack of Growth in Infants and Vitamins " — By T. Koyama. " Jikken Iho ", 1924.

" Vitamin B Deficiency Diseases " — By J. Shimazono. " Jikken Iho ", 1921.

" On the Etiology of Beri-beri " — By J. Shimazono. Far E. T. M. Ass'n, 1926.

" Studies on the Etiology of Beri-beri " — By R. Omori and Collaborators. Japan Med. World, 1922, Vol. 11, No. 5.

" Biostelin " — By K. Takahashi. Sci. Papers Inst. Phys. Chem. Research (Japan), 1924.

" Vitamin Content of Japanese Foodstuffs " — By Y. Shimoda, Y. Fujimaki, H. Matsumuro, and S. Saiki. Reported at the Meeting of the Imp. State Inst. for Nutrition, 1924.

" Formation of Urinary and Bile-duct Calculi in Animals Fed on Experimental Rations " — By Y. Fujimaki. Japan Med. World, 1926, Vol. 6, No. 2.

" Experimental Rickets " — By Y. Fujimaki. Far E. T. M. Ass'n, 1925.

" Influence of Nutrition upon the Healing of Wounds " — By Y. Fujimaki. Reported at the 16th Meeting of Imp. State Inst. for Nutrition, 1926.

" Experimental Rickets " — By T. Okamoto. " Nis'shin Igaku ", Vol. 14, page 1869.

" Catalase in Blood of Avitaminose Animals and Men " — By Takayama. " Nis'shin Igaku ", 1925, Vol. 14, pages 477, 545.

" Polished Rice Disease of Birds " — By T. Ogata, S. Kawakita, and Collaborators. " Nis'shin Igaku ", Vol. 13, pages 287, 413, 549.

" Comparison of Vitamin B and Bios. " — By G. Toda. " Nis'shin Igaku ", 1924, Vol. 13, page 661.

" Studies on Experimental Vitamin A Deficiency Disease " — By S. Kagoshima. " Nis'shin Igaku ", 1924, Vol. 13, pages 81, 197.

" Comparison of Vitamin B contained in the Internal Organs in Human Beri-beri with Birds deficient in Vitamin B " — By T. Ogata and Collaborators. " Nis'shin Igaku ", 1924, Vol. 13, page 742.

" Avitaminose of Man " — By G. Toda. " Nis'shin Igaku ", 1924, Vol. 13, page 1267.

" Detection of Vitamin B by Yeast Broth " — By T. Mitsuo. " Nis'shin Igaku ", 1923, Vol. 12, page 1255.

" Studies on Bios. " — By B. Suzuki and T. Taira. Jour. Chem. Soc. of Japan, 1925, Vol. 45, pages 299, 312.

" Vitamin B Requirement of Different Kinds of Yeast " — By R. Yamamoto. Jour. Agric. Chem Soc. of Japan, 1925, Vol. 1, page 1051.

" Studies on the Chemical Structure of β-acid (Decomposition Product of Oryzenin) ". Jour. Agric. Chem. Soc. of Japan, 1925-1926, Vols. 1 and 2.

" Studies on Vitamin " — By U. Suzuki. Since 1911, Jour. of Chem. Soc. of Japan.

" Studies on the Comparison of Vitamin B Deficiency Disease and Beri-beri " — By T. Shimazono. " Kyoto Igaku Zasshi ", 1924, Vol. 21, page 1476.

" Experimental Studies on the Destruction of Vitamin B " — By K. Umeda. " Kyoto Igaku Zasshi ", 1923, Vol. 20, page 1149.

" Influence of Vitamin on the Growth of Bacteria " — By S. Hosoya and M. Kuroya. " Iji Koron ". 1922, No. 546, page 1923.

" On the Autolysis of Fish Meat " — By T. Otani and K. Shimada. Fishery College Report, 1923, Vol. 19, No. 3.

" On the Artificial Beef Fat " — By M. Hirose. Jour. Soc. Chem. Ind. Japan, 1925, No. 332, page 1101.

" Reproduction and Nutrition " — By H. Matsumuro. Reported at the 16th Meeting of Imp. State Inst. for Nutrition, 1926.

" Studies on the Utilisation of Rice-polishings " — By T. Hara, R. Takata, and H. Matsumuro. Reported at the 14th to 16th meetings of the Imp. State Inst. for Nutrition, 1925-1926.

" Studies on Miso (Bean Paste) " — By T. Hara and R. Takata. Reported at the 16th meeting of the Imp. State Inst. for Nutrition, 1926.

" Changes in Fish and Meat by Cold Storage " — By T. Otani and Collaborators. Fishery College Report, 1924.

1.

THE BASAL METABOLISM OF NORMAL JAPANESE MEN AND WOMEN

By Hideo Takahira.

(From the Imperial State Institute for Nutrition, Tokyo.)

1. Introduction.

Every man and woman has a basal metabolism. The term " basal metabolism " means the minimal heat production of an organism measured while it is in the post-absorptive condition and during muscular repose. It was first described by Magnus-Levy under the term " Grundumsatz " and in the past decade it has been extensively studied in America, especially by Dr. Benedict and his collaborators of the Nutrition Laboratory of the Carnegie Institution of Washington, and Dr. Du Bois and his staff of the Russel Sage Institute of Pathology, Bellevue Hospital.

Since the establishment of our Institute in 1921, I have been engaged in the determination of the basal metabolism of normal Japanese men and women. In this report, I propose to present the results of studies made on 120 adult men and women, and to analyse the data by the biometric method.

2. Experimental Apparatus and Procedure.

The experimental apparatus used was a respiration apparatus for clinical use, devised by Benedict and Tompkins and constructed by Collins of Boston.

The apparatus is one of the closed circuit respiration apparatus of the Regnault and Reiset type and is adapted for experiments of long duration. It consists of a large respiration chamber, universal respiration apparatus and accessory apparatus, namely, gas-meter, balance and barometer, etc. The heat production is calculated indirectly from the oxygen consumption and the carbon dioxide production. A detailed account of the apparatus and the experimental technique may be found in Benedict and Tompkins' article.

First of all, I tested the apparatus with several alcohol check tests and proved that the R.Q. had nearly the correct theoretical value, that is, 0.666. During the course of the human experiments I used the alcohol check test once a week.

The experimental subjects used were selected and divided into the following groups:

1. Ten policemen, from the Metropolitan Police Board.
2. Eleven primary-school teachers in Tokyo.
3. Eleven electric-car conductors and motor-men, of the Tokyo Electric Car Company.
4. Nine barbers, working in various barbers' shops in Tokyo.
5. Eight labourers, usually working out of doors.
6. Nine scholars and office workers, members of the Institute, journalists, school inspectors, etc.
7. Nine factory workmen.
8. Six merchants, dealers in glassware, medical instruments and drugs.

The female subjects were as follows:

9. Sixteen primary-school teachers in Tokyo.
10. Sixteen office girls, from the statistical department of the Tokyo City Office.
11. Eleven labourers, doing physical work in the Army Commissary Department.

The experimental subjects were kept in a room of the Institute over night. At 6 p.m., on entrance, they were given a test meal, with an energy value of 877 calories and containing 5.213 gms. protein in the case of men, or 751 calories, and 4.807 gms. protein in the case of women. The next day, 15 to 18 hours after the last meal, a series of experiments were carried out, with the respiration apparatus, from 9 a.m. to noon. The experimental periods were divided into a preliminary and four subsequent principal periods. Each period continued for half an hour.

3. Experimental Results.

The experiments extended from March 6th, 1921, to February 6th, 1922. The following points were particularly noticed in each experiment: (1) age, (2) body weight, (3) body height, (4) body surface area computed from Du Bois' height-weight formula, (5) quantity of oxygen consumed per hour, (6) quantity of carbon dioxide produced per hour, (7) respiratory quotient, (8) quantity of urine nitrogen per hour, (9) calories produced per hour, (10) calories produced per 24 hours, (11) calories produced per kilogram of body weight per 24 hours, (12) calories produced per square meter of body surface per hour, (13) pulse rate, (14) respiration rate.

The individual data are presented in the attached table (see inset).

4. Biometric Measurements.

The results of the individual measurements were varied and confused, and it was necessary to find a general rule, a law of variation and the correlation of the various physical and physiological characters. I treated my results with biometric formulæ. A biometric study of human basal metabolism was first performed by Benedict and Smith, and my own statistical method is based largely on their work.

The statistical constants to be determined are the average mean, the standard deviation, the variation coefficient, the correlation coefficient and their probable errors.

N° / No.	Sujets / Subjects	Profess / Profess
		Sexe mascul
1	K. Shibuya	Agent de p
2	S. Ikeuchi	Policer
3	Y. Nagasaka	»
86	K. Kiuchi	»
87	U. Fukui	»
88	R. Toda	»
89	F. Nagano	»
90	F. Sato	»
91	F. Saito	»
92	T. Onoda	»
93	R. Miyamoto	»
94	T. Ichino	Employée d
95	T. Wakana	— Office
96	Y. Ishizuka	»
97	I. Kaida	»
98	H. Shioda	»
99	K. Okamura	»
100	K. Nakamura	»
101	S. Kuroki	»
102	T. Nakakubo	»
103	T. Takeuchi	»
104	Y. Matsuzaki	»
105	M. Obama	»
106	M. Nakazawa	»
107	K. Takigawa	»
108	M. Otomo	»
109	H. Uchiyama	»
110	C. Urabe	Manœuvre-I
111	Y. Tatezaki	»
112	U. Sekiguchi	»
113	S. Komoda	»
114	T. Kobayashi	»
115	R. Ishikawa	»
116	M. Okabe	»
117	H. Yamada	»
118	Y. Yamada	»
119	Y. Ito	»
120	K. Tsukada	»

Table 1. — EXPERIMENTAL RESULTS.

N° / No.	Sujets / Subjects	Profession / Profession	Date de l'expérience / Day of experiment	Age (an.) / Age (Yrs.)	Poids (kg.) / Body wt. (kg.)	Taille (cm.) / Body height (cm.)	Superficie m². / Body surface area sq m.	Consommation d'oxygène par heure (l.) Oxygen consumption per hour (l.)	Production de CO_2 par heure (l.) Carbon dioxide production per hour (l.)	R.Q. / R.Q.	N. éliminé dans l'urine (gr.) / Urine nitrogen excretion (gm.)	Production de chaleur par heure (cal.) Heat production per hour (cals.)	Production de chaleur par 24 heures (cal.) Heat production per 24 hours (cals.)	Production de chaleur par kg. en 24 heures (cal.) Heat per kg. per 24 hours (cals.)	Production de chaleur par m² et par heure (cal.) Heat per sq. m. per hour (cals.)	Pouls / Pulse rate	Respiration / Respiration rate
		Sexe masculin – Male															
1	K. Shibuya	Agent de police —	Mar. 6	23	50.1	158.0	1.48	12.35	10.00	0.81	0.3701	58.44	1403	27.95	40.02	57	17
2	S. Ikeuchi	Policeman	» 7	49	49.2	155.6	1.46	12.16	9.91	0.80	0.3906	57.40	1378	28.00	39.31	66	15
3	Y. Nagasaka	»	» 8	24	62.2	164.7	1.64	14.08	12.26	0.87	0.5243	67.36	1617	25.94	41.07	65	14
4	S. Hakozaki	»	Jun. 24	25	61.3	166.9	1.69	14.33	12.66	0.83	0.4211	69.17	1659	27.08	40.92	66	16
5	Y. Kobayashi	»	» 26	24	51.1	159.0	1.51	12.65	10.34	0.82	0.3484	60.00	1440	28.18	39.16	58	22
6	T. Aiba	»	» 26	27	65.5	155.1	1.65	13.83	10.89	0.79	0.4357	65.17	1564	23.87	39.49	56	17
7	U. Kuboki	»	» 27	28	62.5	166.0	1.66	12.30	10.20	0.83	0.3416	58.29	1399	22.38	35.12	50	16
8	I. Watari	»	» 28	24	45.5	157.4	1.43	11.01	9.26	0.84	0.3958	52.36	1257	27.62	36.62	68	17
9	J. Okamoto	»	» 29	30	70.6	164.8	1.78	14.92	12.19	0.82	0.5463	70.79	1699	24.06	39.76	47	18
10	M. Makino	»	» 30	24	52.7	157.2	1.48	11.66	9.44	0.81	0.3181	55.27	1326	25.15	39.34	45	14
11	Y. Sakurai	Professeur – Teacher	» 10	33	62.0	164.5	1.64	13.67	11.00	0.80	0.4608	64.16	1540	24.83	39.12	49	20
12	K. Ibuka	»	» 12	28	53.0	151.0	1.48	10.44	9.74	0.93	0.4920	50.43	1210	22.83	34.07	48	18
13	Y. Owaki	»	» 13	36	45.9	155.3	1.45	10.18	8.33	0.82	0.3908	47.54	1141	24.80	33.24	47	15
14	H. Suzuki	»	» 14	21	49.4	155.3	1.46	10.61	9.52	0.90	0.3719	51.22	1239	25.29	35.08	52	17
15	H. Sakurai	»	» 15	40	55.6	158.8	1.56	13.00	10.37	0.80	0.5856	60.51	1452	25.47	38.79	54	18
16	H. Itagaki	»	» 16	40	60.0	151.3	1.56	12.84	10.40	0.81	0.5314	60.41	1450	24.16	38.72	54	14
17	Y. Nakazawa	»	» 17	36	50.0	159.4	1.50	10.78	9.93	0.87	0.6201	50.84	1220	24.40	33.89	57	18
18	T. Adachi	»	» 19	35	59.1	167.5	1.66	12.77	10.69	0.83	0.7104	59.91	1438	24.37	36.09	45	17
19	S. Shibayama	»	» 20	36	54.3	165.7	1.59	11.90	10.76	0.90	0.2787	58.77	1410	26.11	37.33	54	14
20	T. Nagumo	»	» 22	28	51.8	160.6	1.53	12.13	10.15	0.84	0.3961	57.44	1379	26.50	37.54	60	13
21	K. Ogawa	»	» 23	23	52.7	157.5	1.52	10.88	9.14	0.84	0.4132	51.64	1239	23.49	33.97	49	17
22	K. Hayashi	Chauffeur – Motor-	May 25	40	57.8	163.2	1.62	12.12	10.42	0.86	0.4049	58.21	1397	24.08	35.93	50	17
23	E. Nakajima	man	» 26	26	59.0	157.7	1.59	14.52	11.86	0.82	0.2614	69.04	1657	28.08	43.41	54	15
24	C. Watanabe	Receveur-Conductor	» 27	23	49.0	160.0	1.49	11.54	9.66	0.84	0.3374	55.17	1324	27.02	37.02	50	13
25	I. Aoki	»	» 28	37	57.1	160.2	1.59	12.47	10.63	0.85	0.4753	59.19	1420	24.92	37.22	54	13
26	T. Kanai	»	» 29	23	44.5	154.0	1.38	9.63	8.36	0.87	0.3100	46.30	1121	25.17	33.55	46	17
27	N. Ohashi	Chauffeur – Motor-	» 30	32	62.7	163.2	1.67	13.24	11.86	0.90	0.5537	64.41	1545	24.53	38.56	48	14
28	Y. Itagaki	man	» 31	31	69.7	161.4	1.74	13.39	12.46	0.93	0.6495	64.65	1551	22.16	37.15	56	12
29	F. Hanai	Receveur-Conductor	June 1	38	43.0	155.7	1.32	9.99	8.05	0.81	0.4825	46.59	1118	26.00	35.29	54	14
30	K. Sekuguchi	»	» 2	36	48.5	158.0	1.47	9.82	8.94	0.91	0.6129	47.15	1131	23.57	32.07	49	17
31	I. Ogawara	»	» 3	20	48.8	161.7	1.50	12.61	9.69	0.80	0.3622	60.91	1461	29.83	40.60	66	18
32	H. Aotauka	»	» 9	20	54.0	159.6	1.55	11.45	10.64	0.93	0.5401	55.19	1325	24.52	35.37	60	17
33	K. Hoshino	Coiffeur – Barber	Jul. 3	48	56.6	152.1	1.54	12.21	10.62	0.87	0.3296	58.89	1413	24.97	38.24	63	20
34	S. Ishioka	»	» 4	34	51.2	157.7	1.50	11.44	9.41	0.82	0.4546	53.51	1284	25.10	35.67	65	15
35	Y. Kato	»	» 5	42	56.5	160.0	1.65	12.44	10.46	0.84	0.4095	59.20	1421	25.15	35.88	57	15
36	T. Noguchi	»	» 6	39	45.5	154.3	1.41	10.17	9.64	0.95	0.2930	50.43	1210	26.56	35.77	52	14
37	T. Suzuki	»	» 10	35	54.9	152.8	1.49	11.47	9.54	0.83	0.4312	54.77	1314	23.96	37.26	53	15
38	I. Kasugai	»	» 12	35	45.7	152.5	1.40	10.80	10.35	0.96	0.3502	53.14	1275	27.90	36.53	56	17
39	T. Suzuki	»	» 8	27	46.4	155.9	1.43	10.45	9.01	0.86	0.3184	49.92	1198	25.82	34.90	49	16
40	H. Nogami	»	» 9	29	47.5	150.9	1.41	10.82	9.85	0.91	0.4615	56.05	1345	28.32	39.75	56	18
41	T. Kobayashi	»	» 7	34	54.0	148.3	1.47	10.28	9.78	0.95	0.4108	51.28	1231	22.81	34.88	65	20
42	T. Urano	Manœuvre–Labourer	Apr. 29	18	58.8	157.3	1.59	12.75	11.21	0.88	0.5666	61.40	1474	25.06	38.62	58	14
43	K. Watanabe	»	Mar. 13	33	58.9	155.5	1.53	13.09	11.29	0.86	0.2838	63.62	1527	25.92	41.31	55	13
44	R. Kose	»	» 27	35	48.3	154.3	1.41	11.24	9.27	0.83	0.3888	53.21	1277	26.60	37.73	60	15
45	K. Jinbo	»	Jun. 3	31	57.5	154.6	1.55	12.66	11.24	0.89	0.3635	61.39	1473	25.85	39.60	59	15
46	T. Koyama	»	Mar. 11	52	59.4	162.0	1.63	13.38	10.74	0.80	0.5373	62.92	1510	25.25	38.60	65	16
47	G. Takatori	»	Jul. 26	26	55.0	164.0	1.59	14.32	12.99	0.90	0.4474	69.42	1666	30.29	43.66	58	20
48	S. Katsura	»	Jun. 8	40	41.9	149.6	1.29	10.15	8.76	0.86	0.1220	50.02	1200	29.28	39.39	58	15
49	K. Ishida	»	Mar. 14	28	61.5	168.0	1.70	13.70	12.11	0.88	0.6240	65.59	1574	25.60	38.58	57	14
50	I. Mori	Ouvrier d'usine —	Jul. 12	39	54.0	163.6	1.58	12.91	11.12	0.86	0.5177	61.48	1476	27.32	38.90	62	14
51	H. Fukuzawa	Factory workman	» 13	27	53.2	159.3	1.54	12.51	10.18	0.81	0.5204	58.70	1409	26.48	38.12	56	13
52	H. Sato	»	» 14	25	51.7	158.0	1.47	11.21	9.95	0.89	0.3638	53.94	1295	25.03	36.69	52	16
53	S. Mori	»	» 15	20	58.4	157.5	1.59	11.04	10.78	0.98	0.2547	56.36	1353	23.33	35.44	51	21
54	S. Iida	»	» 18	23	50.2	161.1	1.55	12.68	10.75	0.85	0.3638	60.45	1451	28.93	39.00	46	16
55	C. Kobayashi	»	» 20	35	47.4	161.0	1.47	11.19	9.87	0.88	0.4003	53.83	1292	27.28	36.61	62	18
56	T. Okazaki	»	» 21	21	45.7	157.4	1.43	10.32	9.41	0.92	0.2267	50.25	1206	26.38	35.13	62	19
57	K. Ito	»	» 22	42	55.4	155.1	1.53	11.53	10.47	0.91	0.2864	56.78	1363	24.59	37.10	64	20
58	G. Kagami	»	» 25	58	38.6	156.7	1.32	9.62	8.95	0.93	0.1289	47.42	1138	29.48	35.89	64	24
59	H. Ito	Intellectuels et em-	Jun. 23	37	58.5	165.4	1.64	13.37	10.21	0.76	0.4612	62.51	1500	25.64	38.11	53	16
60	C. Honda	ployés de bureau —	» 28	38	64.4	166.0	1.72	13.08	11.55	0.88	0.3422	63.10	1514	23.51	36.68	68	20
61	K. Toyama	Scholar and office	» 16	37	63.5	164.6	1.70	14.34	10.78	0.75	0.3052	67.39	1617	25.47	39.64	60	14
62	S. Shindo	worker	» 18	43	44.7	159.6	1.43	9.37	8.84	0.94	0.3578	45.75	1098	24.59	32.00	60	14
63	T. Kawakami	»	Feb. 28	34	52.4	158.5	1.55	12.52	10.15	0.81	0.3701	59.34	1428	27.17	38.28	58	16
64	M. Kikuchi	»	Mar. 9	25	67.8	165.2	1.74	13.80	11.24	0.81	0.3833	65.75	1578	23.27	37.78	-	17
65	Y. Furumizo	»	» 11	21	51.6	152.8	1.47	10.64	9.62	0.91	0.3329	51.75	1242	24.06	35.20	62	16
66	K. Shigata	»	Jul. 11	27	43.5	155.0	1.38	11.03	10.12	0.91	0.3664	54.18	1278	29.39	38.74	56	16
67	K. Takagoromo	»	Oct. 8	34	57.9	169.0	1.66	13.40	10.85	0.81	0.3765	63.54	1525	26.36	38.28	60	15
68	I. Yamana	»	» 3	27	50.9	157.6	1.50	11.51	10.88	0.95	0.3951	56.52	1357	26.67	37.60	—	20
69	T. Ito	»	Nov. 12	29	77.0	155.5	1.76	14.34	12.34	0.86	0.3872	68.95	1655	21.49	39.17	68	16
70	A. Iwase	Négociant-Merchant	Apr. 20	23	39.2	149.0	1.29	9.35	8.97	0.96	0.2388	46.23	1109	28.45	35.83	57	14
71	H. Takahashi	»	» 11	26	46.3	155.3	1.42	11.13	9.16	0.83	0.4219	52.54	1261	27.39	36.27	60	12
72	K. Ishikawa	»	» 22	24	47.0	153.9	1.42	10.17	8.61	0.85	0.3789	48.28	1159	27.07	34.74	47	15
73	M. Kimura	»	May 4	27	42.8	157.4	1.39	9.61	8.36	0.84	0.2684	46.35	1112	25.87	33.34	45	15
74	T. Tsutsui	»	Jul. 24	26	49.3	157.5	1.48	11.55	9.85	0.85	0.2329	55.49	1332	27.01	37.48	54	15
75	K. Suda	»	» 15	24	46.0	160.5	1.45	11.13	9.57	0.85	0.3359	54.81	1315	28.59	37.79	64	16
76	H. Takahira	»	May 8	26	52.5	160.0	1.60	11.97	10.40	0.87	0.4544	57.23	1374	26.15	35.77	66	20
77	S. Kitagawa	»	» 15	24	51,6	161.0	1.53	(11.49	9.42	0.83	0.4998	54.00	1296	25.11	35.30	64	18
		Sexe féminin - Female															
78	Y. Ito	Institutrice – Teacher	Oct. 6	36	45.5	154.2	1.37	8.19	7.54	0.92	0.3245	39.80	955	20.99	29.05	—	16
79	R. Abe	»	» 8	36	41.8	149.5	1.32	9.13	7.66	0.84	0.2671	43.82	1051	25.16	33.19	62	14
80	K. Ishizawa	»	» 9	33	42.8	142.9	1.24	8.50	7.82	0.92	0.2971	41.25	990	23.14	33.26	—	17
81	F. Mukai	»	» 10	30	53.2	155.4	1.49	9.55	8.44	0.88	0.3435	45.80	1099	20.74	30.74	65	17
82	H. Ayukai	»	» 11	36	49.5	147.5	1.41	8.45	7.63	0.90	0.2730	41.05	985	19.91	29.12	60	14
83	I. Kobayashi	»	» 12	27	42.3	152.0	1.38	8.06	7.58	0.94	0.2962	39.47	947	22.38	28.60	—	12
84	T. Okayama	»	» 13	33	45.5	147.5	1.36	8.33	8.28	0.98	0.2485	42.20	1013	22.26	31.03	—	13
85	S. Hayashi	»	» 14	41	50.3	148.6	1.42	10.64	8.15	0.77	0.4149	49.27	1183	23.51	34.41	—	16
86	K. Kiuchi	»	» 16	39	66.5	156.0	1.66	10.50	9.31	0.89	0.3654	50.80	1219	18.33	30.60	—	18
87	U. Fukui	»	» 17	31	41.0	153.8	1.34	10.85	8.24	0.76	0.2800	50.84	1220	29.75	37.93	66	12
88	R. Toda	»	» 19	27	47.8	150.6	1.41	9.77	8.87	0.91	0.3481	47.11	1130	23.65	33.41	74	18
89	F. Nagano	»	Apr. 25	31	50.5	145.7	1.41	9.11	7.49	0.82	0.1674	43.71	1049	20.77	31.00	57	16
90	F. Sato	»	May 6	26	45.0	141.0	1.28	8.28	7.76	0.93	0.3063	40.44	971	21.56	31.59	—	17
91	F. Saito	»	Aug. 8	24	42.5	152.4	1.35	8.37	7.16	0.85	0.2264	39.88	957	22.52	29.53	68	20
92	T. Onoda	»	» 9	46	47.1	147.5	1.38	8.47	7.78	0.92	0.1737	41.57	978	20.75	30.12	52	18
93	R. Miyamoto	»	Jul. 10	50	43.0	147.1	1.32	8.11	7.50	0.93	0.3413	39.35	944	21.96	29.81	60	14
94	T. Ichino	Employée de bureau	Nov. 13	20	51.8	155.9	1.51	11.16	8.78	0.79	0.4323	55.48	1268	24.49	34.97	74	16
95	T. Wakana	— Office girl	» 14	19	49.9	155.3	1.47	11.89	9.68	0.81	0.4615	55.88	1341	26.82	38.01	66	20
96	Y. Ishizuka	»	» 15	23	43.2	149.5	1.34	8.93	7.65	0.86	0.2767	42.67	1024	23.73	31.84	60	15
97	I. Kaida	»	» 16	26	50.8	150.5	1.45	11.12	8.21	0.74	0.3326	51.82	1244	24.48	35.74	—	15
98	H. Shioda	»	» 17	16	56.5	155.0	1.54	10.80	9.46	0.88	0.3726	51.99	1248	22.08	33.76	55	15
99	K. Okamura	»	» 18	20	40.9	153.0	1.33	9.71	8.94	0.92	0.3084	46.32	1117	27.09	34.82	54	15
100	K. Nakamura	»	» 20	21	41.0	145.7	1.29	10.84	8.86	0.82	0.2003	48.17	1156	28.19	37.34	—	16
101	S. Kuroki	»	» 21	21	46.3	155.0	1.42	9.56	9.10	0.95	0.5960	46.59	1118	24.14	32.81	67	12
102	T. Nakakubo	»	» 22	23	56.0	154.0	1.53	12.82	10.59	0.83	0.4988	61.15	1467	26.20	39.96	61	14
103	T. Takeuchi	»	» 24	20	41.8	142.8	1.28	11.11	9.25	0.83	0.2618	48.01	1152	26.87	37.51	72	19
104	Y. Matsuzaki	»	» 25	21	42.5	140.2	1.24	9.84	8.12	0.82	0.2101	46.94	1127	31.45	37.85	—	14
105	M. Obama	»	» 27	20	38.6	142.7	1.24	9.15	7.93	0.87	0.3877	43.84	1052	27.32	35.35	84	17
106	M. Nakazawa	»	» 28	20	42.9	145.9	1.32	8.36	7.72	0.92	0.3622	40.50	971	22.68	30.67	77	17
107	K. Takigawa	»	» 29	26	52.3	152.3	1.47	10.72	8.66	0.81	0.4642	50.62	1215	23.25	34.43	52	14
108	M. Otomo	»	» 30	19	43.0	149.9	1.34	9.97	8.21	0.82	0.3750	47.09	1130	26.28	35.14	70	23
109	H. Uchiyama	»	Dec. 1	25	45.5	143.3	1.33	9.95	8.23	0.83	0.4991	46.62	1119	24.59	35.05	52	16
110	C. Urabe	Manœuvre–Labourer	Jun. 5	24	46.5	142.9	1.34	9.84	9.24	0.94	0.2644	48.04	1153	24.75	35.11	70	16
111	Y. Tatezaki	»	Jan. 22	28	41.3	141.5	1.26	9.50	8.78	0.92	0.3026	46.27	1110	26.87	36.72	66	20
112	U. Sekiguchi	»	» 24	36	41.6	143.2	1.27	9.23	9.11	0.98	0.2335	46.36	1113	26.74	36.50	72	20
113	S. Komoda	»	» 25	50	41.3	147.0	1.30	8.50	7.90	0.93	0.2450	41.58	998	24.19	31.98	51	16
114	T. Kobayashi	»	» 26	50	38.5	146.3	1.25	8.21	7.99	0.97	0.1924	40.61	975	25.31	32.48	56	14
115	R. Ishikawa	»	» 27	42	39.9	141.4	1.22	8.60	8.15	0.95	0.2559	42.12	1011	25.36	34.52	78	18
116	M. Okabe	»	» 29	35	43.1	135.8	1.24	10.52	9.56	0.91	0.2972	51.08	1103	25.60	37.08	62	18
117	H. Yamada	»	» 30	46	37.3	141.3	1.20	8.15	7.49	0.92	0.1989	39.72	953	25.55	33.09	52	12
118	Y. Yamada	»	» 31	20	45.3	132.0	1.22	9.42	9.29	0.98	0.3625	47.49	1140	26.29	38.92	74	15
119	Y. Ito	»	Feb. 3	37	45.4	148.3	1.36	10.24	8.86	0.87	0.2651	49.11	1178	25.95	36.11	64	19
120	K. Tsukada	»	» 6	36	43.0	136.4	1.24	8.63	8.02	0.93	0.2693	42.26	1014	23.59	34.08	64	14

The experimental subjects considered are 77 men and 43 women. The following table represents the physical and physiological characters taken into account. The symbol in parenthesis is the one used to designate the particular measurement in the statistical formulæ.

Table 2. — Statistical Constants and their Probable Errors.

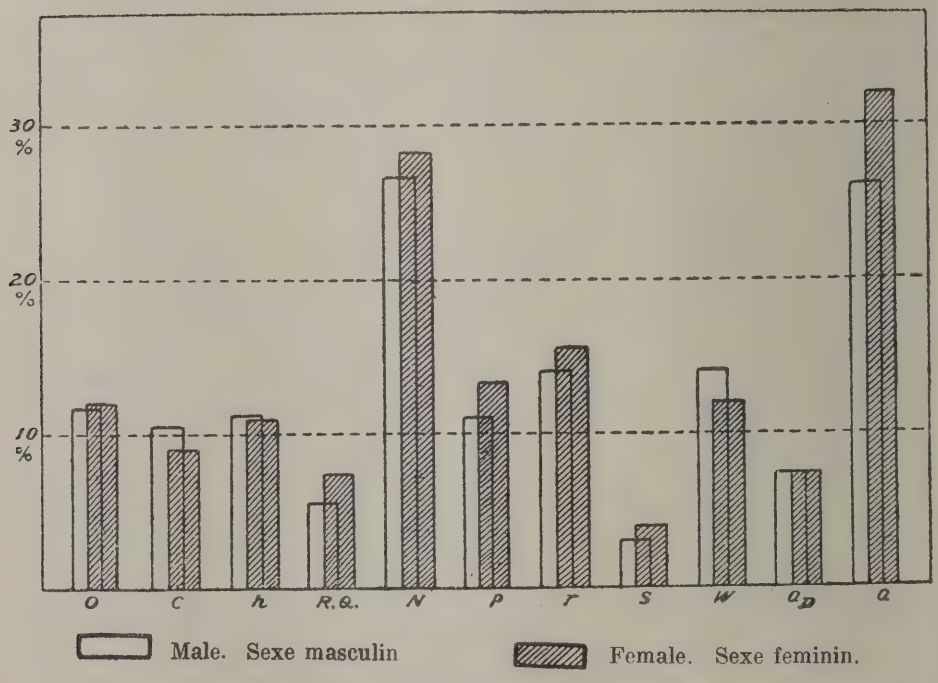
		Sexe Sex	Moyenne Average mean	Ecart quadratique moyen Standard deviation	Coefficient de variabilité Variation coefficient
Taille . . . . . Body height . . .	(*h*)	M.	158.6±12.35	5.053±0.2782	3.19±0.1756
		F.	147.4±15.16	5.868±0.4268	3.98±0.2895
Poids . . . . . Body weight . . .	(*w*)	M.	53.54±4.170	7.567±0.4166	14.14±0.7785
		F.	45.55±4.686	5.606±0.4077	12.31±0.7855
Superficie du corps . Body surface area .	(a^D)	M.	1.529±0.1191	0.1132±0.0062	7.40±0.4074
		F.	1.352±0.1391	0.1003±0.0073	7.42±0.5397
Age	(*a*)	M.	31.2±2.430	8.097±0.4458	25.95±1.429
		F.	30.2±3.122	9.641±0.7012	31.92±2.257
Consommation d'oxygène . . . Oxygen consumption	(*o*)	M.	11.93±0.9292	1.419±0.0781	11.89±0.6549
		F.	9.56±0.9834	1.154±0.0804	12.07±0.8778
Production de CO^2 . Carbon dioxide production	(*c*)	M.	10.24±0.7975	1.093±0.0610	10.67±0.5675
		F.	8.38±0.8620	0.7672±0.0545	9.16±0.6662
R. Q.		M.	0.86±0.0669	0.0482±0.0027	5.60±0.3083
		F.	0.89±0.0915	0.0668±0.0049	7.50±0.5454
N. éliminé dans l'urine Urine nitrogen excretion	(*n*)	M.	0.4021±0.0313	0.1066±0.0059	26.51±1.461
		F.	0.3161±0.0325	0.0911±0.0066	28.82±2.024
Production de chaleur par 24 h. . Heat production per 24 hours	(*h*)	M.	1373±106.9	156.1±8.579	11.37±0.6260
		F.	1073±110.4	117.1±8.516	10.91±0.7956
Pouls . . . . . Pulse rate	(*p*)	M.	56±4.421	6.329±0.3534	11.30±0.6304
		F.	64±7.514	8.540±0.7090	13.34±1.108
Respiration . . . . Respiration rate . .	(*r*)	M.	16±1.362	2.239±0.1232	13.99±0.7702
		F.	16±1.646	2.487±0.1809	19.54±1.130

The results show that in the average man of 158.6 cms. body height, 53.54 kgms. body weight, 1.529 sq.m. body surface area, and 31.2 years of age, there is a basal heat production of 1,373 calories. The average respiratory quotient is 0.86. The average excretion of urine nitrogen is 0.4021 gms. The average basal pulse rate is 56 and the respiration rate is 16. In the average woman of 147.4 cms. body height, 45.55 kgms. of body weight, 1.352 sq.m. body surface area, and 30.2 yrs. of age, there is a basal heat production of 1,073 calories. The average respiratory quotient is 0.89. The average excretion of urine nitrogen 0.3101 gms. The average

basal pulse rate is 64, and the respiratory rate is 16. It is noticed that the respiratory quotient and the pulse rate in female subjects are a little higher than in male subjects. This probably is due to the emotional excitability of the female subjects.

A comparison of the variation coefficients of the various physical and physiological characters is charted in Diagram 1. The variation coefficients of body height, R.Q. and body surface area are relatively small. The variabilities of body weight, oxygen consumption, carbon dioxide production, heat production, pulse rate, and respiration rate are nearly 10 per cent. The variabilities of the basal gaseous exchange and heat production are slightly smaller than those of pulse and respiration rate. The excretion of urine nitrogen and the age are the most variable factors.

Diagram 1. — Comparison of the Variation Coefficients of Physical and Physiological Characters.



The correlation coefficients between the physical and the physiological characters have been determined and are represented in Table 3. The physical characters considered are the body height, the body weight, the body surface area and the age, and the physiological characters considered are the oxygen consumption, the carbon dioxide production and the heat production. The correlation between them is represented in Table 4 by means of the ratio of the correlation coefficients and their probable errors. In Diagrams 2 to 7 is also represented the correlation between the physical characters and the heat production. Although there may be a certain correlation between the physiological characters reciprocally, *e.g.*, between the metabolism and the pulse rate, it has not been determined.

Table 3. — Correlation Coefficients.

	Sexe Sex	s	w	a^D	a
o	M.	0.5929±0.0505	0.8274±0.0213	0.8606±0.0202	—0.0174±0.0779
	F.	0.3173±0.0933	0.5136±0.0757	0.5028±0.0769	—0.5279±0.0742
c	M.	0.5043±0.0581	0.8173±0.0259	0.8045±0.0275	—0.0515±0.0777
	F.	0.0850±0.1021	0.4266±0.0841	0.4550±0.0811	—0.4079±0.0857
h	M.	0.5800±0.0517	0.7794±0.0306	0.8628±0.0199	—0.0537±0.0777
	F.	0.3659±0.0890	0.5479±0.0720	0.5674±0.0595	—0.4693±0.0802

Table 4. — Correlation expressed in $\frac{\gamma}{E^{\gamma}}$.

	Sexe Sex	s	w	a^D	a
o	M.	11.73	38.91	42.60	0.22
	F.	3.40	6.78	6.54	7.12
c	M.	8.68	31.58	29.28	0.66
	F.	0.83	5.07	5.61	4.64
h	M.	11.22	25.48	43.33	0.69
	F.	4.11	7.61	9.54	5.85

Diagram 2. — The Correlation between Heat Production and Body Height (Male).

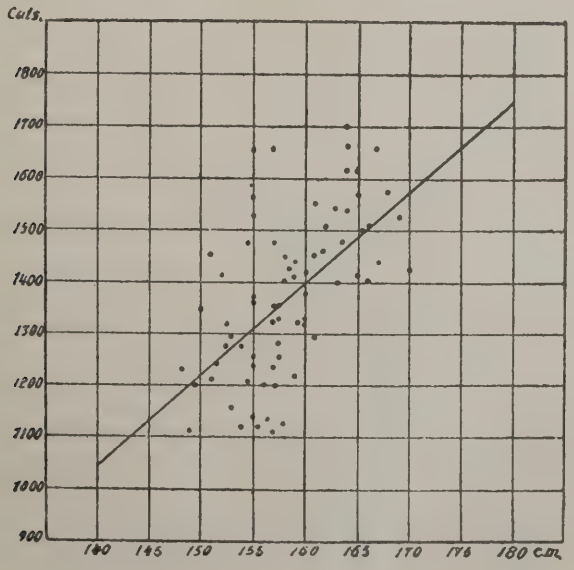


Diagram 3. — The Correlation between Heat Production and Body Weight (Male).

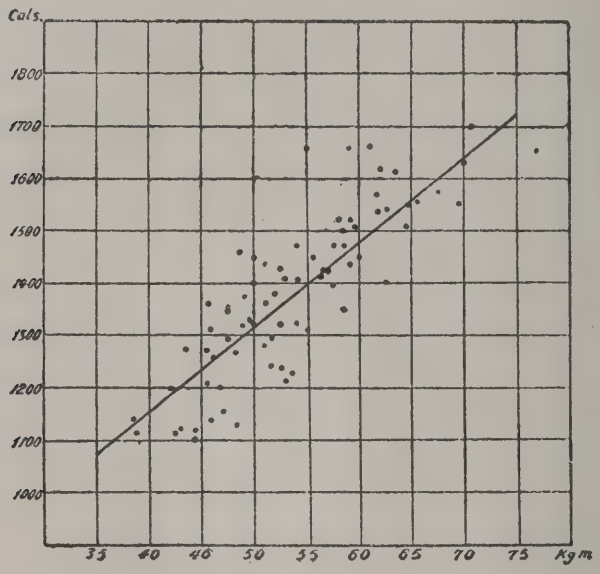


Diagram 4. — The Correlation between Heat Production and Body Surface Area (Male).

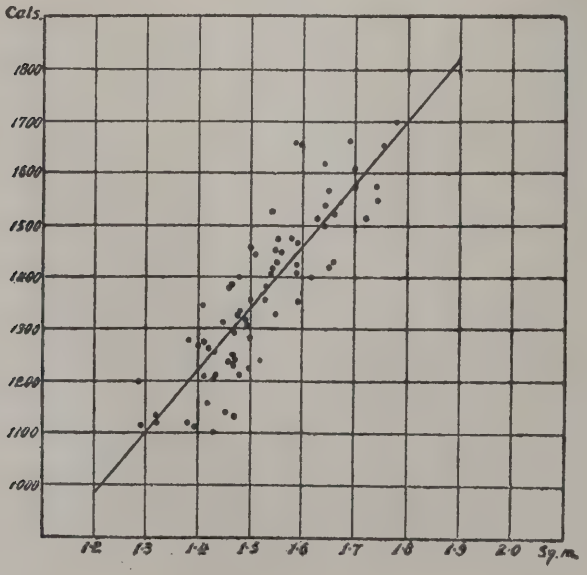


Diagram 5. — The Correlation between Heat Production and Body Height (Female).

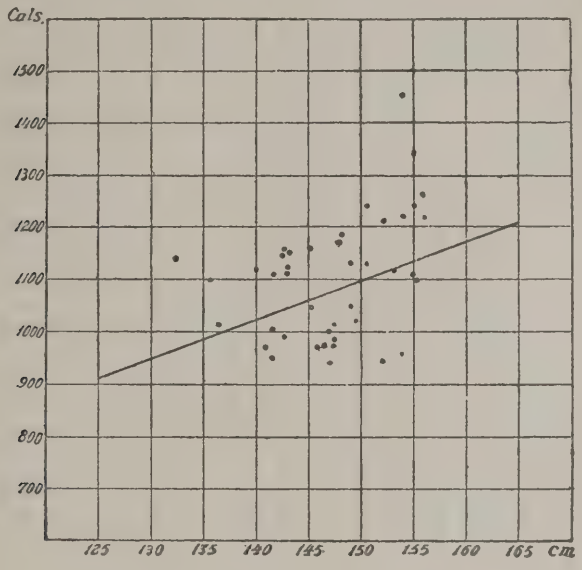


Diagram 6. — The Correlation between Heat Production and Body Weight (Female).

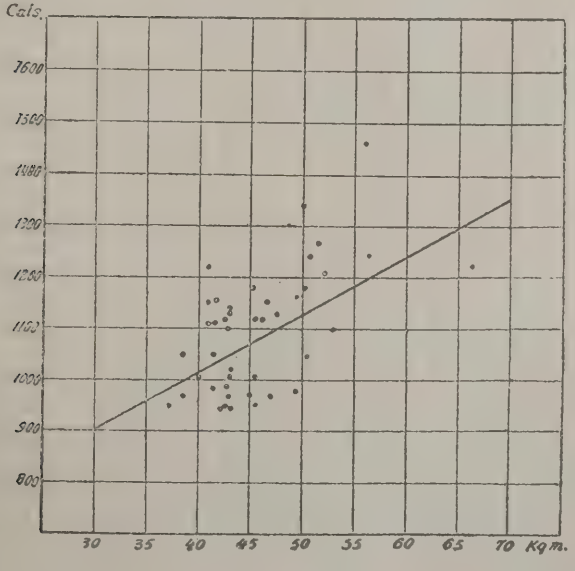
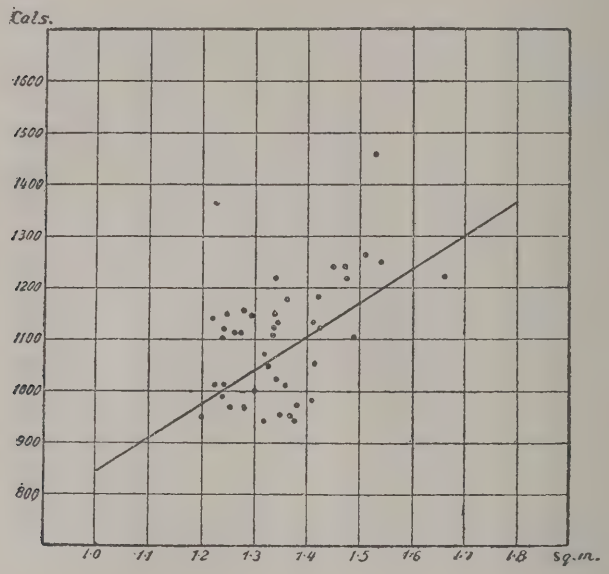


Diagram 7. — The Correlation between Heat Production and Body Surface Area (Female).



The correlation coefficients of the body height, the body weight, and the body surface area to the metabolism are all positive in sign, but the coefficient of age is negative in sign. This means that the metabolism decreases as the age advances.

The correlation coefficients of male subjects are generally higher than those of female subjects. In both sexes the body surface area has a most intimate correlation with the metabolism. The correlation between age and metabolism is different in the two sexes; in female subjects the correlation coefficient is from 0.4 to 0.5, but in male subjects there is no significant correlation. This is due to the mode of selection of the subjects.

5. Discussion of the Results.

(1) *Critique of the Body Surface Law.*

The heat production of man and animals depends largely upon their size, but it is not directly proportional to the body weight. A large man gives off more heat than a small man; but for each kilogram of body weight a small person produces more heat than a large one. On the other hand, the metabolism of man and animals of various sizes and shapes is fairly closely proportional to the surface area of the body. In 1883, Rubner established this law of body surface area and was able to show that mice, rabbits, dogs, men and horses have almost the same metabolism per square

meter of body surface. The principle embodied in this law is that the basal metabolism is a simple function of the body surface area. Even after the establishment of this principle, however, investigators were handicapped for years through the lack of an accurate method for measuring or calculating the body surface area.

Eugene F. Du Bois, in collaboration with Delafield Du Bois, devised the linear formula in 1915, and the height-weight formula in 1916. Using these formulæ, Du Bois proved that the body surface law holds true in the case of human basal metabolism. But a criticism that there is no relationship between body surface area and the metabolism has been brought forward by Benedict.

Calculated from my results, the correlation coefficients between the heat production and the body weight or the body surface area are as follows:

$$\text{Male} \quad \gamma^{wh} = 0.7794 \pm 0.0306, \frac{\gamma}{E^{\gamma}} = 25.48$$

$$\gamma^{aDh} = 0.8628 \pm 0.0199, \frac{\gamma}{E^{\gamma}} = 43.33$$

$$\text{Female} \quad \gamma^{wh} = 0.5479 \pm 0.0720, \frac{\gamma}{E^{\gamma}} = 7.61$$

$$\gamma^{aDh} = 0.5674 \pm 0.0595, \frac{\gamma}{E^{\gamma}} = 9.54$$

It is apparent that the body surface area is more closely related to the heat production than the body weight.

The average basal heat production per square meter of body surface per hour in the adult Japanese is 37.33 calories for males, and 33.84 calories for females. The average heat production per kilogram of body weight per day is 25.84 calories for males and 24.12 calories for females. The statistical constants determined worked out as follows:

Male	Surface unit	Weight unit
Average mean	37.33 ± 2.907	25.84 ± 2.013
Standard deviation	2.340 ± 0.1288	1.915 ± 0.1054
Variation coefficient	6.27 ± 0.3452	7.41 ± 0.4080
Female		
Average mean	33.84 ± 3.481	24.12 ± 2.481
Standard deviation	2.928 ± 0.2129	2.417 ± 0.1758
Variation coefficient	8.65 ± 0.6291	10.02 ± 0.7284

In males, the variation coefficient of a surface unit is 6.27 and that of a weight unit is 7.41 per cent. In females they are 8.65 and 10.02 per cent respectively. Thus the basal metabolism expressed in the surface unit is less variable than that expressed in the weight unit.

According to Du Bois, Means, Labbé and Stévenin, an obese person has a lower metabolism than a thin person per weight unit, but there is no difference in the metabolism per surface unit. To examine this point, I have taken the metabolism of ten obese men and compared it with the average value according to the surface and weight units respectively. The grade of obesity is simply expressed in the ratio of the body height and body weight.

Table 5.

Sujet Subject	h /w	Unité de poids Weight unit			Unité de superficie Surface unit		
		Calories	Deviation	Deviation %	Calories	Deviation	Deviation %
Maniwa	2.36	23.87	—1.97	— 8	39.49	+2.16	+ 5
Ibuka	2.86	22.83	—3.01	—13	34.07	—3.26	—10
Itagaki	2.52	24.16	—1.68	— 7	38.72	+1.39	+ 4
Itagaki	2.31	22.16	—3.68	—17	37.15	—0.28	— 1
Hoshino	2.68	24.97	—0.87	— 3	38.24	+0.91	+ 2
Kobayashi	2.75	22.81	—3.03	—13	34.88	—2.45	— 7
Honda	2.50	23.51	—2.23	—10	36.68	—0.65	— 2
Toyama	2.61	25.47	—0.37	— 1	39.64	+2.31	+ 6
Kikuchi	2.43	23.27	—2.57	—11	37.78	+0.45	+ 1
Ito	2.02	21.49	—4.35	—20	39.17	+1.84	+ 5
Moyenne Average	—	—	—2.39	—11	—	+0.28	+ 0.3

With the weight unit the basal metabolism is 11 per cent smaller than the average value, but with the surface unit it coincides with the average value. The above results show from various points of view that the body surface law holds true in the basal metabolism of men and women.

(2) *Changes of the Metabolism according to Age.*

One would expect age to have a definite bearing on metabolism and research has proved this to be true. The level of the metabolism varies greatly with age. During the period of growth the metabolism is relatively high and in old age the metabolism is slightly decreased. Between the adult ages of 20 and 50 there is comparatively little change.

In my results the correlation coefficients between the total heat production and age are as follows:

Male . . . . . $\gamma^{ah} = 0.0537 \pm 0.0777, \frac{\gamma}{E^{\gamma}} = 0.67$

Female . . . . $\gamma^{ah} = 0.4693 \pm 0.0802, \frac{\gamma}{E^{\gamma}} = 5.85$

There is a relatively high correlation between the metabolism and age in females but no significant correlation in males. The difference in the correlation in the two sexes is not of a fundamental nature but is due to the selection of the subjects. If we consider the 30 males who were policemen, conductors and workmen instead of all 78 male subjects, there is a definite correlation between the metabolism and age:

Mean of age . . . . . = 29.8
Mean of heat production . . . . . = 1,393
Standard deviation of age . . . . . = 9.015
Standard deviation of heat production . . . = 154.4
γ^{ah} . . . . . = 0.2331

Diagram 8. — The Correlation between Age and Heat Production (Male).

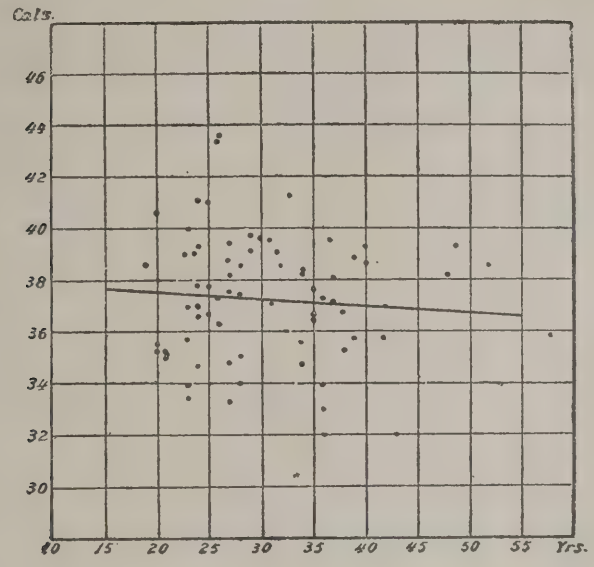
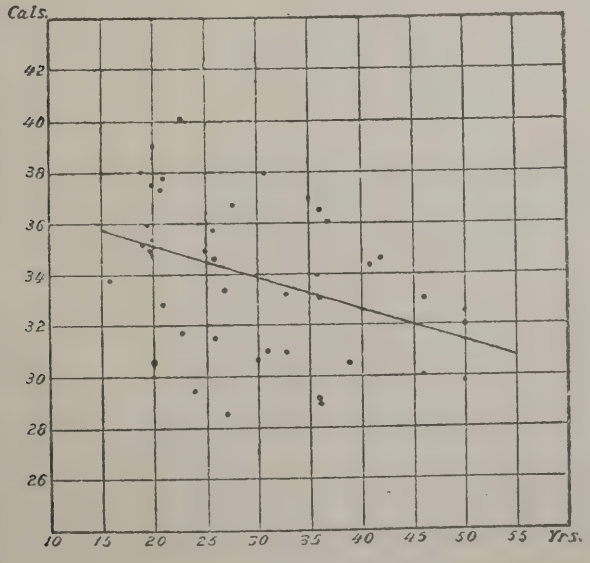


Diagram 9. — The Correlation between Age and Heat Production (Female).



According to Sondén and Tigerstedt, the correlation coefficients of carbon dioxide production and age are as follows:

Male . . . . $\gamma^{ac} = 0.629 \pm 0.076$
Female . . $\gamma^{ac} = 0.058 \pm 0.163$

Unlike the last case, the correlation in males is relatively high, but in females it is not significant.

We are sure that the correlation between metabolism and age does not exist invariably, but there is a definite correlation if a sufficiently large number of examples are included.

Diagrams 8 and 9 represent graphically the correlation between heat production per square meter per hour and age. The correlation coefficients are as follows:

Male . . . . . $\gamma^{ah} = 0.0947 \pm 0.0771$, $\frac{\gamma}{E^{\gamma}} = 1.23$

Female . . . . $\gamma^{ah} = 0.4174 \pm 0.0849$, $\frac{\gamma}{E^{\gamma}} = 4.91$

(3) *Changes of Metabolism according to Sex.*

The heat production of men was higher than that of women. Comparisons between the average daily heat production, the heat production per kilogram per 24 hours and the heat production per square meter per hour were made:

	Male	Female	Difference
Daily heat production	1,373 cals.	1,073 cals.	22 %
Heat per kgm. per 24 hours .	25.84 »	24.12 »	6 %
Heat per sq. m. per hour . .	37.33 »	33.84 »	9 %

The metabolism of females was compared with the metabolism predicted by the first prediction method, which will be described later on.

The results were as follows:

Table 6.

Age	Nombre de sujets Number of subjects	Age moyen Age (average)	Taille moyenne Height (average)	Poids moyen Weight (average)	Superficie moyenne Surface area (average)	Calories (average)	Calories chez l'homme Calories in man	Difference	%
20—24	13	21.3	147.0	44.41	1.34	1131	1223	— 92	— 7.5
25—29	7	26.4	147.3	46.43	1.36	1105	1236	—131	—10.6
30—34	5	31.6	149.1	46.60	1.38	1074	1257	—183	—14.5
35—39	8	36.4	146.3	47.05	1.36	1077	1218	—141	—11.5
40—44	2	41.5	144.7	45.10	1.34	1097	1191	— 94	— 7.8
45—49	2	46.0	144.4	42.20	1.28	965	1131	—166	—14.6
Moy. Aver.	—	—	—	—	—	—	—	—	—11.1

The metabolism of men was 11 per cent higher than that of women.

(4) *Constancy of the Basal Metabolism in the same Individual.*

The basal metabolism varies according to body height, body weight, body surface area, age and sex. In the unit of body surface area corrected by the age factor, there is still individual variation. Du Bois said that the basal metabolism which varies within ± 10 per cent from individual to individual is normal. There is, however, a constant basal metabolism in the same individual on different days.

An experiment was performed on myself and my colleague, S. Kitagawa, on each of six successive days, with the following results:

Table 7. — Subject Takahira, 169 cm. Body Height, 26 Years.

Date	Poids Weight	Consommation d'O^2 O_2 consumption	Production de CO^2 CO_2 production	R. Q.	Elimination de N N excretion
May 8 mai	52.6	11.99	10.59	0.88	0.4500
9	52.2	11.89	10.37	0.87	0.3591
10	52.1	12.52	10.44	0.83	0.4009
11	52.5	11.78	10.25	0.88	0.4818
12	52.7	12.17	10.32	0.85	0.5027
13	53.0	11.49	10.40	0.91	0.5320
Moyenne – Average	52.5	11.97	10.40	0.87	0.4544

Subject Kitagawa, 161 cm. Body Height, 24 Years.

Date	Poids Weight	Consommation d'O^2 O_2 consumption	Production de CO^2 CO_2 production	R. Q.	Elimination de N N excretion
May 15 mai	51.3	11.36	9.49	0.84	0.6120
16	51.3	11.30	9.19	0.84	0.5605
17	51.7	11.34	9.41	0.83	0.4544
18	51.3	11.65	9.43	0.81	0.3261
19	51.5	11.45	9.31	0.81	0.5473
20	51.4	11.82	9.66	0.82	0.4446
Moyenne – Average	51.4	11.49	9.42	0.83	0.4908

The average basal heat production per hour of Takahira was 57.23 cals., the standard deviation was 1.334 cals., and the variation coefficient was 2.33 per cent. The basal value of S. Kitagawa was 54 cals., the standard deviation was 1.109 cals., and the variation coefficient was 2.05 per cent. The basal metabolism of the same individual was constant within the variability of about 2 per cent.

Table 8.

Jour Day	Takahira		Kitagawa	
	Nombre de calories par heure Calories per hour	Déviation Deviation	Nombre de calories par heure Calories per hour	Déviation Deviation
1	57.39	+ 0.16	53.33	— 0.67
2	57.05	— 0.18	52.67	— 1.33
3	59.56	+ 2.33	53.50	— 0.50
4	56.28	— 0.95	55.18	+ 1.18
5	57.84	+ 0.61	53.50	— 0.50
6	55.24	— 1.98	55.81	+ 1.81
Ecart moyen Mean deviation	57.23	—	54.00	—
	—	.334	—	± 1.109
Variation	—	2.33	—	2.05

6. Normal Standard of Basal Metabolism and its Application to the Experimental Results.

(1) *Normal Standard of Basal Metabolism of the Japanese.*

The importance of the normal standard of basal metabolism in men and women was early recognised; the investigation of normal metabolism is useful for a basis of comparison with the metabolism of individuals performing different amounts of work, subsisting on different diets or suffering from various diseases.

Du Bois considered body surface and age as the most accurate physiological factors to which to refer the metabolism of individuals. After the body surface has been computed by means of the height-weight formula, one can find in the table the number of calories per square meter of body surface corresponding to the particular age, and easily calculate the normal basal metabolism.

Harris and Benedict assert that the metabolism of the human body, even at rest, does not depend upon Newton's law of cooling and therefore is not proportional to the body surface. They maintain that, in predicting basal metabolism, biologically, the most rational and, practically the most satisfactory method is that secured by taking into account the body weight, stature and age of the subject. Each of these factors, they believe, has an independent influence upon metabolism. They have therefore prepared two formulæ from which to predict the daily basal heat production from body weight, stature and age.

Dreyer has objected to the introduction of the standing height as a factor in the calculation of the surface area on the ground that it is not a physiological measurement, and he regards the sitting height as a more appropriate measurement. He has evolved two formulæ based on age and weight alone.

Means and Woodwell have presented a critical analysis of the variation between, and the relative accuracy of, these three kinds of standards for estimating normal basal metabolism. After a thorough study of the merits of the three standards, they reach the conclusion that the results obtained with the three are so similar

that a subtraction of 1.8 calories from each of Du Bois' standards will render the difference between the Du Bois and the Harris-Benedict values so slight as to be almost negligible.

I have elaborated three methods of calculating the normal standard of the basal metabolism of the Japanese. These methods are based on those of Du Bois, Harris-Benedict and Dreyer as above mentioned, but the value of the heat production and the constants in the formulæ were changed in accordance with my own results.

1. With the Du Bois height-weight formula $A = W^{.425} \times H^{.125} \times 72.46$, the surface area of the body is calculated from the body weight and body height. This figure is then multiplied by that representing the basal metabolism according to age and sex, as shown in the following table. This gives the basal metabolism per hour, and multiplied by 24 gives the calories produced in 24 hours.

Age	Male	Female
20 to 30	37.83 cals.	34.34 cals.
31 to 40	37.33 »	33.84 »
41 to 50	36.83 »	33.34 »

2. Applying the following formula, the basal metabolism per day can be calculated from the body height, weight and age.

Male . $h = 222.121 + 5.975s + 5.361w - 2.683a$
Female $h = 591.620 + 2.434s + 3.815w - 1.689a$

(h = calories per day, s = body height in cms., w = body weight in kilograms, a = age in years.)

3. Applying the following formula, the basal metabolism per day can be calculated from the body weight and age:

$$\text{Male} \ldots h = \frac{\sqrt{w}}{0.1070 \times a^{0.1333}}$$

$$\text{Female} \ldots h = \frac{\sqrt{w}}{0.1251 \times a^{0.1333}}$$

The above calculations are rather complicated. Therefore, I have devised a simple method of finding the basal metabolism by means of charts.

The foregoing three methods give about the same results, but each has its particular value. For instance, the third formula does not take into consideration the body height, consequently the calculations for an unusually tall person would be erroneous.

The same holds true in the case of the second formula. In this case, if body height and weight are unusual, the result is erroneous. These two formulæ could not be applied for the prediction of the basal metabolism of European and American subjects. In such cases the first formula is the best.

(2) *Application of the Normal Standard to Experimental Results.*

The normal standard of basal metabolism has been settled. I must now compare my experimental results with this normal standard. The differences between the experimental results and the standard metabolism predicted by these three methods have been calculated. The results are as follows:

Table 9. — Policemen.

Sujets Subject	Cal. (expér.) Cals. (Experimental)	Cal. I méth. Cals. I method	Diff.	%	Cal. II méth. Cals. II method	Diff.	%	Cal. III méth. Cals. III method	Diff.	%
Shibuya . . .	1403	1347	+ 56	+ 4.2	1373	+ 30	+ 2.2	1377	+ 26	+ 1.9
Ikeuchi . . .	1378	1284	+ 94	+ 7.3	1284	+ 94	+ 7.5	1234	+144	+11.7
Nagasaka . .	1617	1493	+124	+ 8.3	1475	+142	+ 9.6	1526	+ 91	+ 6.0
Hakosaki . .	1659	1534	+125	+ 8.1	1481	+177	+12.0	1506	+153	+10.2
Kobayashi .	1440	1375	+ 65	+ 4.7	1382	+ 58	+ 4.2	1383	+ 57	+ 4.1
Maniwa . . .	1564	1494	+ 10	+ 4.7	1428	+136	+ 9.5	1541	+ 23	+ 1.5
Kuboki . . .	1399	1503	—104	— 6.9	1474	— 75	— 5.1	1498	— 99	— 6.6
Watari . . .	1257	1302	— 45	— 3.5	1342	— 85	— 6.3	1305	— 48	— 3.7
Okamoto . .	1699	1608	+ 91	+ 5.7	1505	+194	+12.9	1578	+121	+ 7.7
Makino . . .	1326	1347	— 21	— 1.6	1380	— 54	— 3.9	1405	— 79	— 5.6
Moyenne . Average . .	—	—	—	+ 3.10	—	—	+ 4.26	—	—	+ 2.72
Moyenne totale Total average	—	—	—	—	—	—	—	—	—	+ 3.36

Table 10. — Teachers.

Sujets Subject	Cal. (expér.) Cals. (Experimental)	Cal. I méth. Cals. I method	Diff.	%	Cal. II méth. Cals. II method	Diff.	%	Cal. III méth. Cals. III method	Diff.	%
Sakurai . . .	1540	1473	+ 67	+ 4.6	1449	+ 91	+ 6.3	1460	+ 80	+ 5.5
Ibuka. . . .	1210	1340	—130	— 9.7	1333	—123	— 9.2	1380	—170	—12.3
Owaki . . .	1141	1299	—158	—12.2	1300	—159	—12.2	1242	—101	— 8.1
Suzuki . . .	1239	1333	— 94	— 7.1	1359	—120	— 8.8	1384	—145	—10.5
Sakurai . . .	1452	1390	+ 62	+ 4.5	1362	+ 90	+ 6.2	1348	+104	+ 7.7
Hagaki . . .	1450	1390	+ 60	+ 4.3	1341	+109	+ 7.5	1400	+ 50	+ 3.6
Isawa . . .	1220	1344	—124	— 9.2	1346	—126	— 9.4	1296	— 76	— 5.9
Adachi . . .	1438	1487	— 49	— 3.3	1446	— 8	— 0.6	1414	— 24	+ 1.7
Shibayama .	1410	1425	— 15	— 1.1	1407	+ 3	+ 0.2	1351	+ 59	+ 4.4
Nagumo . .	1379	1385	— 6	— 0.4	1384	— 5	— 0.4	1364	+ 15	+ 1.1
Ogawa . . .	1239	1384	—145	—10.5	1384	—145	—10.1	1413	—174	—12.3
Moyenne . Average . .	—	—	—	— 3.65	—	—	— 2.77	—	—	— 2.28
Moyenne totale Total average	—	—	—	—	—	—	—	—	—	— 2.90

Table 11. — Conductors and Motor-men.

Sujets Subject	Cal. (expér.) Cals. (Experimental)	Cal. I méth. Cals. I method	Diff.	%	Cal. II méth. Cals. II method	Diff.	%	Cal. III méth. Cals. III method	Diff.	%
Hayashi. . .	1397	1444	— 47	— 3.3	1400	— 3	— 0.2	1374	+ 23	+ 1.7
Nakashima .	1657	1444	+213	+14.8	1411	+246	+17.4	1470	+187	+12.7
Watanabe .	1324	1356	— 32	— 2.4	1379	— 55	— 4.0	1362	— 38	— 2.8
Aoki	1420	1421	— 1	— 0.1	1386	+ 34	+ 2.5	1380	+ 40	+ 2.9
Kanai . . .	1121	1256	—135	—10.7	1319	—198	—15.0	1298	—177	—13.6
Ohashi . . .	1545	1504	+ 41	+ 2.7	1448	+ 97	+ 6.7	1474	+ 71	+ 4.8
Hagaki . . .	1551	1567	— 16	— 1.0	1477	+ 74	+ 5.0	1561	— 10	— 0.6
Hanai . . .	1118	1179	— 61	— 5.2	1281	—163	—12.7	1193	— 75	— 6.3
Sekiguchi . .	1131	1317	—186	—14.1	1330	—199	—15.0	1277	—146	—11.4
Ogawara . .	1641	1373	+ 88	+ 6.4	1396	+ 65	+ 4.7	1385	+ 76	+ 5.5
Aotsuka. . .	1325	1418	— 93	— 6.6	1412	— 87	— 6.2	1457	—132	— 9.1
Moyenne . Average . .	—	—	—	— 1.77	—	—	— 1.53	—	—	— 1.47
Moyenne totale Total average	—	—	—	—	—	—	—	—	—	— 1.59

Table 12. — Barbers.

Sujets Subject	Cal. (expér.) Cals. (Experimental)	Cal. I méth. Cals. I method	Diff. Diff.	% %	Cal. II méth. Cals. II method	Diff. Diff.	% %	Cal. III méth. Cals. III method	Diff. Diff.	% %
Hoshino. . .	1413	1358	+ 54	+ 4.0	1306	+107	+ 8.2	1327	+ 86	+ 6.5
Ishioka . . .	1284	1347	— 63	— 4.7	1448	— 64	— 4.7	1322	— 38	— 2.9
Kato	1421	1467	— 46	— 3.1	1428	— 7	— 0.5	1319	+102	+ 7.7
Noguchi. . .	1210	1256	— 46	— 3.7	1286	— 76	— 5.9	1223	— 13	— 1.1
Suzuki . . .	1314	1335	— 21	— 1.6	1336	— 22	— 1.6	1363	— 49	— 3.6
Kasugai . . .	1275	1254	+ 21	+ 1.7	1284	— 9	— 0.7	1244	+ 31	+ 2.5
Suzuki . . .	1198	1295	— 97	— 7.5	1330	—132	— 9.9	1297	— 99	— 7.6
Nogami . . .	1345	1273	+ 72	+ 5.7	1301	+ 44	+ 3.4	1300	+ 45	+ 3.5
Kaboyashi .	1231	1321	— 90	— 6.8	1306	— 75	— 5.7	1357	— 126	— 9.3
Moyenne . Average . .	—	—	—	— 1.78	—	—	— 1.93	—	—	— 0.48
Moyenne totale Total average	—	—	—	—	—	—	—	—	—	— 1.40

Table 13. — Labourers.

Sujets Subject	Cal. (expér.) Cals. (Experimental)	Cal. I méth. Cals. I method	Diff.	%	Cal. II méth. Cals. II method	Diff.	%	Cal. III méth. Cals. III method	Diff.	%
Urano . . .	1474	1455	+ 19	+ 1.3	1429	+ 45	+ 3.1	1542	— 68	— 4.4
Watanabe .	1527	1383	+114	+10.4	1379	+148	+10.7	1423	+104	+ 7.3
Kose	1277	1263	+ 14	+ 1.1	1309	— 32	— 2.4	1279	— 2	— 0.2
Shinbo . . .	1473	1396	+ 77	+ 5.5	1371	+102	+ 7.4	1418	+ 55	+ 3.9
Koyama . .	1510	1429	+ 81	+ 5.7	1369	+141	+10.3	1345	+165	+12.3
Takatori . .	1666	1444	+222	+15.4	1427	+239	+16.7	1420	+246	+17.3
Katsura . . .	1200	1150	+ 50	+ 4.3	1233	— 33	— 2.7	1170	+ 30	+ 2.6
Ishida . . .	1574	1539	+ 35	+ 2.3	1481	+ 93	+ 6.3	1486	+ 88	+ 5.9
Moyenne . Average . .	—	—	—	+ 5.75	—	—	+ 6.18	—	—	+ 5.59
Moyenne totale Total average	—	—	—	—	—	—	—	—	—	+ 5.84

Table 14. — Factory Workmen.

Sujets Subject	Cal. (expér.) Cals. (Experimental)	Cal. I méth. Cals. I method	Diff.	%	Cal. II méth. Cals. II method	Diff.	%	Cal. III méth. Cals. III method	Diff.	%
Mori	1476	1408	+ 68	+ 4.8	1384	+ 92	+ 6.6	1333	+143	+10.7
Fukusawa .	1409	1395	+ 14	+ 1.0	1387	+ 22	+ 1.6	1389	+ 20	+ 1.4
Sato	1295	1335	— 40	— 3.0	1346	— 51	— 3.8	1384	— 88	— 6.4
Mori	1253	1455	—102	— 7.0	1423	— 70	— 4.9	1515	—162	—10.7
Ida	1451	1411	+ 40	+ 2.8	1392	+ 59	+ 4.2	1379	+ 72	+ 5.2
Kobayashi .	1292	1317	— 25	— 1.9	1344	— 52	— 3.9	1267	+ 25	+ 2.0
Okazaki . . .	1206	1305	— 99	— 7.6	1351	—145	—10.7	1331	—125	— 9.4
Ito	1363	1360	+ 3	+ 0.2	1333	+ 30	+ 2.3	1337	+ 26	+ 1.9
Kagami . .	1138	1160	— 22	— 1.0	1210	— 72	— 6.0	1069	+ 69	+ 6.5
Moyenne . Average . .	—	—	—	— 1.30	—	—	— 2.13	—	—	+ 0.13
Moyenne totale Total average	—	—	—	—	—	—	—	—	—	— 1.19

Table 15. — SCHOLARS, ETC.

Sujets Subject	Cal. (expér.) Cals. (Experimental)	Cal. I méth. Cals. I method	Diff.	%	Cal. II méth. Cals. II method	Diff.	%	Cal. III méth. Cals. III method	Diff.	%
Ito	1500	1465	+ 35	+ 2.4	1425	+ 75	+ 5.3	1397	+103	+ 7.4
Honda . . .	1514	1534	— 23	— 1.5	1457	+ 57	+ 3.9	1460	+ 54	+ 3.7
Toyama . . .	1617	1719	+ 98	+ 6.4	1447	+170	+11.7	1455	+162	+11.1
Shindo . . .	1098	1267	—169	—13.3	1300	—2.2	—15.5	1196	— 98	— 8.2
Kawakami .	1428	1392	+ 36	+ 2.6	1359	+ 69	+ 5.1	1337	+ 91	+ 6.7
Kikuchi . . .	1578	1580	— 2	— 0.1	1505	+ 73	+ 4.8	1584	— 6	— 0.3
Furumizo . .	1242	1342	—100	— 7.4	1355	—113	— 8.4	1415	—173	—12.2
Shigeta . . .	1278	1250	+ 28	+ 2.2	1300	— 31	— 2.4	1256	+ 22	+ 1.7
Takagoromo	1525	1491	+ 34	+ 2.3	1451	+ 74	+ 5.1	1405	+120	+ 8.5
Yamana . .	1357	1358	— 1	— 0.1	1364	— 7	— 0.5	1359	— 11	— 0.2
Ito	1655	1589	+ 66	+ 4.2	1486	+169	+11.3	1655	0	0
Moyenne . Average . .	—	—	—	— 0.21	—	—	— 1.86	—	—	+ 1.66
Moyenne totale Total average	—	—	—	—	—	—	—	—	—	+ 1.10

Table 16. — MERCHANTS.

Sujets Subject	Cal. (expér.) Cals. (Experimental)	Cal. I méth. Cals. I method	Diff.	%	Cal. II méth. Cals. II method	Diff.	%	Cal. III méth. Cals. III method	Diff.	%
Iwase	1109	1174	— 65	— 5.5	1261	—152	—12.1	1218	—109	— 8.9
Takahashi . .	1261	1289	— 28	— 2.2	1328	— 67	— 5.1	1303	— 42	— 3.2
Ishiyama . .	1159	1393	—234	—16.8	1324	—165	—12.5	1326	—167	—11.8
Kimura . . .	1112	1259	—147	—11.6	1320	—208	—15.7	1246	—134	—10.8
Tsutsui . . .	1332	1344	— 12	— 0.9	1358	— 26	— 1.9	1344	— 12	— 0.9
Suda	1315	1320	— 5	— 0.3	1363	— 48	— 3.6	1312	+ 3	+ 0.2
Moyenne . Average . .	—	—	—	— 6.25	—	—	— 8.48	—	—	— 5.90
Moyenne totale Total average	—	—	—	—	—	—	—	—	—	— 6.87

Table 17. — Teachers.

Sujets Subject	Cal. (expér.) Cals. (Experimental)	Cal. I méth. Cals. I method	Diff.	%	Cal. II méth. Cals. II method	Diff.	%	Cal. III méth. Cals. III method	Diff.	%
Ito	955	1113	—158	—14.2	1080	—125	—11.6	1057	—102	— 9.6
Abe	1051	1072	— 21	— 2.0	1054	— 3	— 0.3	1013	+ 38	+ 3.7
Ishisawa . .	990	1010	— 20	— 2.0	1047	— 57	— 5.4	1037	— 47	— 4.5
Mukai . . .	1099	1221	—122	—10.0	1122	— 23	— 2.5	1199	—100	— 8.3
Ayukai . . .	985	1145	—160	—14.0	1079	— 94	— 8.7	1103	—118	—10.7
Kobayashi .	947	1134	—187	—16.5	1077	—130	—12.1	1059	—112	—10.5
Okayama . .	1013	1108	— 95	— 8.4	1068	— 55	— 5.1	1070	— 57	— 5.3
Hayashi. . .	1183	1143	+ 40	+ 3.5	1074	+109	+10.1	1093	+ 90	+ 8.2
Kiuchi . . .	1219	1340	—121	— 9.0	1159	+ 60	+ 5.2	1264	— 45	— 3.5
Fukui. . . .	1220	1095	+125	+11.4	1070	+150	+14.0	1024	+ 96	+ 9.3
Tomita . . .	1130	1159	— 29	— 2.5	1095	+ 35	+ 3.2	1126	+ 4	+ 0.3
Nagano . . .	1049	1152	—103	— 9.1	1087	— 38	— 3.5	1136	— 87	— 7.6
Sato	971	1055	— 84	— 8.0	1063	— 92	— 8.6	1098	—127	—11.6
Saito	957	1116	—159	—14.2	1084	—127	— 2.7	1079	—122	—11.3
Onoda . . .	978	1104	—126	—11.4	1053	— 75	— 7.1	1043	— 65	— 6.2
Miyamoto . .	944	1050	—106	—10.0	1030	— 86	— 8.3	985	— 41	— 4.1
Moyenne . Average . .	—	—	—	— 7.28	—	—	— 2.71	—	—	— 4.48
Moyenne totale Total average	—	—	—	—	—	—	—	—	—	— 4.82

Table 18. — Office Girls.

Sujets Subject	Cal. (expér.) Cals. (Experimental)	Cal. I méth. Cals. I method	Diff.	%	Cal. II méth. Cals. II method	Diff.	%	Cal. III méth. Cals. III method	Diff.	%
Ichino . . .	1268	1255	+ 13	+ 1.0	1135	+133	+11.7	1220	+ 48	+ 2.2
Wakana. . .	1341	1222	+119	+ 9.7	1128	+213	+18.8	1206	+135	+11.2
Ishitsuka . .	1024	1108	— 84	— 7.6	1081	— 56	— 5.2	1094	— 70	— 6.4
Kaida . . .	1244	1195	+ 49	+ 4.1	1108	+136	+11.3	1167	+ 77	+ 6.6
Shiota . . .	1248	1280	— 32	— 2.5	1157	+ 91	+ 7.8	1313	— 65	— 4.9
Okamura . .	1117	1106	+ 11	+ 1.0	1086	+ 31	+ 2.9	1084	+ 33	+ 3.0
Nakamura. .	1156	1069	+ 87	+ 8.1	1067	+ 89	+ 8.3	1079	+ 77	+ 7.1
Kuroki . . .	1118	1177	— 59	— 5.0	1110	+ 8	+ 0.7	1146	— 28	— 2.4
Nakakubo . .	1467	1264	+203	+16.1	1141	+326	+28.6	1245	+222	+17.8
Takeuchi . .	1152	1064	+ 88	+ 8.3	1065	+ 87	+ 8.2	1096	+ 56	+ 5.1
Matsusaki . .	1127	1028	+ 99	+ 9.6	1060	+ 67	+ 6.3	1098	+ 29	+ 2.6
Obama . . .	1052	1031	+ 21	+ 2.0	1052	0	0	1053	— 1	— 0.1
Nakasawa .	971	1097	—126	—11.5	1077	—106	— 9.8	1110	—139	—12.5
Takigawa . .	1215	1212	+ 3	+ 0.2	1108	+ 97	+ 8.7	1184	+ 31	+ 2.6
Otomo . . .	1130	1114	+ 16	+ 1.4	1088	+ 42	+ 3.9	1119	+ 11	+ 0.9
Uchiyama .	1119	1096	+ 23	+ 2.1	1072	+ 47	+ 4.4	1110	+ 9	+ 0.8
Moyenne . Average . .	—	—	—	+ 2.31	—	—	+ 6.66	—	—	+2.10
Moyenne totale Total average	—	—	—	—	—	—	—	—	—	+3.69

Table 19. — LABOURERS.

Sujets Subject	Cal. (expér.) Cals. (Experimental)	Cal. I méth. Cals. I method	Diff.	%	Cal. II méth. Cals. II method	Diff.	%	Cal. III méth. Cals. III method	Diff.	%
Urabe . . .	1153	1108	+ 45	+ 4.1	1076	+ 77	+ 7.2	1129	+ 24	+ 2.1
Tatesaki . .	1110	1035	+ 75	+ 7.2	1046	+ 64	+ 6.1	1047	+ 73	+ 7.0
Sekiguchi . .	1113	1031	+ 82	+ 8.0	1038	+ 75	+ 7.2	1011	+102	+ 1.0
Komoda . .	998	1034	— 36	— 3.5	1023	— 25	— 2.4	964	+ 34	+ 3.5
Kobayashi .	975	994	— 19	— 1.9	1010	— 35	— 3.4	931	+ 44	+ 4.7
Ishikawa . .	1011	982	+ 29	— 3.0	1017	— 6	— 0.6	970	+ 41	+ 4.2
Okabe . . .	1103	1007	+ 96	+ 9.5	1027	+ 76	+ 7.4	1033	+ 70	+ 6.8
Yamada . .	953	960	— 7	— 7.3	1000	— 47	— 4.7	927	+ 26	+ 2.8
Yamada . .	1140	1014	+124	+12.2	1045	+ 95	+ 9.0	1117	+ 23	+ 2.1
Ito	1178	1101	+ 77	+ 7.0	1064	+114	+10.7	1053	+115	+11.9
Tsukada . .	1014	1007	+ 7	+ 0.7	1027	— 13	— 1.2	1028	— 14	— 1.4
Moyenne . } Average . . }	—	—	—	+ 3.55	—	—	+ 3.21	—	—	+ 4.06
Moyenne totale } Total average }	—	—	—	—	—	—	—	—	—	+ 3.61

Table 20. — SUMMARISING TABLE.

Groupes de sujets Group of subjects	Méthode I Method	Méthode II Method	Méthode III Method	Moyenne Average
Agents de police – Policemen	+ 3.10	+ 4.26	+ 2.72	+ 3.36%
Instituteurs – Teachers. . .	— 3.65	— 2.77	— 2.28	— 2.90%
Receveurs – Conductors . .	— 1.77	— 1.53	— 1.47	— 1.59%
Coiffeurs – Barbers	— 1.78	— 1.93	— 0.48	— 1.40%
Manœuvres – Labourers . .	+ 5.75	+ 6.18	+ 5.59	+ 5.84%
Ouvriers d'usine – Factory workmen.	— 1.30	— 2.13	+ 0.13	— 1.19%
Intellectuels – Scholars, etc.	— 0.21	+ 1.86	+ 1.66	+ 1.10%
Négociants – Merchants . .	— 6.25	— 8.48	— 5.90	— 6.87%
Sexe féminin – Female				
Institutrices – Teachers . .	— 7.28	— 2.71	— 4.48	— 4.82%
Employées de bureau – Office girls	+ 2.31	+ 6.66	+ 2.10	+ 3.69%
Manœuvres – Labourers . .	+ 3.55	+ 3.21	+ 4.06	+ 3.61%

As is shown in Table 20, these three prediction methods gave almost the same results. The variation of the metabolism in various groups ranges from + 5.84 to — 6.87 per cent in males and from + 3.69 to — 4.82 per cent in females. Considering the divergence of the metabolism of particular individuals from the normal standard, one can conclude the following:

1. The average metabolism is higher in persons of larger body size, *e.g.*, larger body weight or body height.
2. The metabolism is higher in younger persons.
3. The average metabolism is higher in the group of labourers and lower in the group of teachers and merchants.

(3) *The Difference in the Basal Metabolism of Japanese and Americans.*

There are differences in the dietaries, muscular work, climate and mode of living of the races. Is there any difference in the basal metabolism between the Japanese and European or American people ? To elucidate this point, I may quote the following four series of experimental results obtained with the universal respiration apparatus or the respiration calorimeter:

1. Results of Palmar, Means and Gamble on eight normal men.
2. Results of Carpenter, Emmes, Hendry and Roth on 31 normal men.
3. Results of Palmar, Means and Gamble on seven normal women.
4. Results of Johnson, Corson and Roth on 20 normal women.

The difference between the figures obtained with American subjects and those predicted by the first method in the case of Japanese subjects have been calculated. The results are as follows:

Table 21. — Results of Palmar, Means and Gamble.

Sujets Subject	Age	Poids Weight	Taille Height	Superficie Surface area	Cal. Cals.	Cal. méth. I Cals. I meth.	Diff.	%
W. W. P.	32	93.9	187	2.20	2004	1982	+ 22	+ 1.1
H. L. H.	27	62.0	172	1.73	1574	1567	+ 7	+ 0.4
W. S. W.	25	73.8	177	1.91	1660	1734	— 74	— 4.2
L. W. H.	25	68.4	169	1.79	1671	1625	+ 46	+ 2.8
P. H. P.	27	77.2	172	1.91	1620	1729	— 109	— 6.3
J. H. M.	29	70.7	175	1.85	1599	1671	— 72	— 4.3
J. L. G.	30	68.1	181	1.87	1679	1089	— 10	— 0.6
L. H. N.	31	58.1	169	1.67	1452	1504	— 52	— 3.4
Moyenne Average	—	—	—	—	—	—	—	—1.81%

Table 22. — Results of Carpenter, Emmes, Hendry and Roth.

Sujet Subject	Age	Poids Weight	Taille Height	Superficie Surface area	Cal. Cals.	Cal. méth. I Cals. I meth.	Diff.	%
W. G. S.	19	63.5	171	1.75	1704	1601	+ 103	+ 6.4
E. R. K.	20	69.0	168	1.78	1812	1629	+ 183	+11.2
A. S. P.	21	69.3	169	1.80	1733	1643	+ 90	+ 5.4
J. L. G.	21	65.5	163	1.71	1600	1621	— 21	— 1.3
G. C. G.	22	71.3	171	1.83	1874	1670	+ 204	+12.2
R. T. V.	22	65.8	175	1.80	1610	1643	— 33	— 2.0
H. H. H.	22	71.5	173	1.84	1793	1679	+ 114	+ 6.8
J. F. T.	22	63.8	188	1.87	1750	1707	+ 43	+ 2.5
D. G. H.	22	52.1	176	1.63	1549	1488	+ 61	+ 4.1
R. K. B.	22	65.8	179	1.83	1694	1670	+ 24	+ 1.4
C. A. C.	22	64.9	180	1.83	1656	1670	— 14	— 0.8
A. C. B.	22	77.6	175	1.93	1533	1761	—227	—12.8
H. A. M.	23	63.5	174	1.76	1702	1602	+ 100	+ 6.2
S. N. G.	23	60.8	178	1.76	1827	1602	+ 225	+14.0
W. J. S.	23	56.5	172	1.67	1330	1520	—190	—12.5
H. O.	23	67.2	172	1.79	1628	1615	+ 13	+ 0.8
C. F. M.	23	51.1	161	1.52	1258	1384	—126	— 9.1
O. A. G.	24	66.8	166	1.74	1788	1584	+ 204	+12.9
T. H. N.	24	69.1	190	1.95	1868	1775	+ 93	+ 5.2
A. G. N.	24	59.9	172	1.71	1600	1557	+ 43	+ 2.7
F. S.	24	57.4	172	1.68	1515	1529	— 14	— 0.9
W. F. M.	24	76.1	181	1.96	1863	1784	+ 79	+ 4.4
C. S. B.	24	61.4	174	1.74	1632	1584	+ 48	+ 3.0
L. J. T.	25	52.5	176	1.73	1471	1471	— 100	— 6.3
L. F. F.	25	57.5	167	1.64	1606	1489	—117	— 7.8
J. A. C.	25	59.6	177	1.74	1663	1580	+ 83	+ 5.2
H. B.	25	64.6	166	1.72	1482	1562	— 80	— 5.1
G. A. B.	26	61.8	167	1.70	1493	1543	— 50	— 3.2
K. B. C.	26	79.8	177	1.98	1759	1798	— 39	— 2.1
K. G. M.	32	68.8	171	1.80	1889	1621	+ 268	+16.5
R. W. P.	44	64.3	170	1.75	1572	1551	+ 20	+ 1.3
Moyenne Average	—	—	—	—	—	—	—	+ 2.38

Table 23. — Results of Palmar, Means and Gamble.

Sujet Subject	Age	Poids Weight	Taille Height	Superficie Surface area	Cal. Cals.	Cal. méth. I Cals. I meth.	Diff.	%
M. A. H.	21	57.9	157	1.57	1434	1301	+ 133	+10.2
R. R.	24	20.9	169	1.81	1648	1496	+ 152	+10.1
H.	22	48.1	155	1.44	1143	1194	— 51	— 4.3
D. L.	21	76.0	168	1.86	1497	1542	— 45	— 2.9
F. M. R.	20	77.7	166	1.85	1635	1538	+ 97	+ 6.5
L. F. W.	21	79.8	170	1.92	1480	1591	— 111	— 7.0
R. Rob.	23	67.5	170	1.78	1444	1471	— 27	— 1.8
Moyenne Average	—	—	—	—	—	—	—	+ 1.54

Table 24. — Results of Johnson, Corson and Roth.

Sujets Subject	Age	Poids Weight	Taille Height	Superficie Surface area	Cal. Cals.	Cal. méth. I Cals. I meth.	Diff.	%
M.	24	56.6	160	1.58	1302	1306	— 4	— 3.1
G. B.	44	82.6	176	1.99	1383	1597	— 214	—13.4
W.	44	72.0	164	1.78	1418	1429	— 11	— 0.7
M. H.	34	70.2	160	1.74	1494	1417	+ 77	+ 5.4
O. C.	35	66.8	163	1.72	1579	1407	+ 72	+ 5.1
E. R.	22	62.7	169	1.72	1694	1426	+268	+18.6
W.	38	61.6	171	1.72	1341	1393	— 52	— 3.7
A. N. D.	41	60.7	101	1.64	1250	1320	— 70	— 5.3
M. C.	45	60.1	163	1.65	1608	1320	+ 288	+21.7
M. F.	26	59.5	156	1.68	1640	1385	+ 255	+18.4
Ma H.	20	54.5	162	1.57	1418	1306	+ 112	+ 8.5
M.	37	53.8	169	1.61	1203	1304	— 101	— 7.7
A. R. K.	25	53.5	156	1.52	1362	1253	+ 109	+ 8.7
A. E. M.	22	52.5	158	1.52	1130	1260	— 130	—10.3
L. M.	32	50.0	157	1.48	1390	1209	+ 181	+14.9
H. W.	24	49.1	160	1.49	1153	1231	— 78	— 6.3
M. M. C.	26	48.9	157	1.47	1287	1212	+ 75	+ 6.1
E. B. X.	26	44.2	159	1.42	1292	1140	+ 122	+10.4
M. M.	19	43.9	152	1.37	1143	1139	+ 4	+ 0.3
M. F.	22	41.3	157	1.36	1073	1127	— 54	— 4.8
Moyenne Average	—	—	—	—	—	—	—	+ 3.14

The differences are as follows:

	%
1.	—1.81
2.	—2.38
3.	—1.54
4.	—3.14

The difference is relatively small and varies from + 3.14 to — 1.81 per cent. One can say that the metabolism of the Japanese and the Americans is essentially the same.

7. Summary.

The basal metabolism of 120 normal men and women was studied with the respiration apparatus for clinical use. The experimental results were treated with biometric formulæ, and the average mean, the standard deviation, the variation coefficient and the correlation coefficient were determined. The results were also studied by means of graphs.

The metabolism was found to be proportional to the body height, body weight and body surface area of the subjects, but the body surface area was the most important factor. The correlation coefficient between the body surface area and the metabolism was 0.8628 in men and 0.5674 in women. The basal metabolism per square meter of body surface per hour was 37.33 calories in men and 33.84 calories in women.

The age had some influence on the basal metabolism. In the adult age of 20 to 50 years there was a correlation coefficient of — 0.0537 in men and —0.4693 in women.

The basal metabolism of men was higher than that of women. The difference between the daily heat production of men and women amounted to 22 per cent; the difference per body weight unit was 6 per cent and per body surface unit 9 per cent. Comparing the metabolism of women with the predicted metabolism for men, we found a difference of 11 per cent.

The basal metabolism varied considerably from individual to individual, but it was almost constant in the same individual.

To predict the basal metabolism of normal Japanese men and women I have devised the following three methods based on the Du Bois, Harris-Benedict, and Dreyer methods.

1. By means of the Du Bois height-weight formula $A = W^{.425} \times H^{.725} \times 72.46$, the body surface area is computed. The normal basal metabolism per square meter per hour is found in the following table:

Age	Male	Female
20 to 30	37.83	34.34
31 to 40	37.33	33.84
41 to 50	36.83	33.34

2. By means of the following formulæ, the basal metabolism per 24 hours can be calculated from the body height, weight and age:

Male . . . . $h = 222.121 + 5.975s + 5.361\ w - 2.683a$
Female . . . $h = 591.620 + 2.433s + 3.815\ w - 1.689a$

3. By means of the following formulæ, the basal metabolism per 24 hours can be calculated from the body weight and age:

$$\text{Male} \quad . \quad . \quad . \quad . \quad h = \frac{\sqrt{w}}{0.1070 \times a^{0.1333}}$$

$$\text{Female} \quad . \quad . \quad . \quad h = \frac{\sqrt{w}}{0.1251 \times a^{0.1333}}$$

These three methods give about the same results when applied to the normal Japanese man and woman.

Comparing the basal metabolism of the various groups of policemen, teachers, conductors, motor-men, barbers, labourers, scholars, factory workmen, merchants, office girls and women labourers, the average variation was from + 5.84 to — 6.84 per cent. It should be noticed that the basal metabolism is relatively higher in subjects of larger body size, in younger persons and in labourers.

The basal metabolism of American subjects is essentially the same as that of the Japanese.

2.

THE BASAL METABOLISM OF COMMON LABOURERS.

By Hideo Takahira, Sadayoshi Kitagawa, Eiichi Ishibashi, and Seizo Kayano.

(From the Imperial State Institute for Nutrition, Tokyo.)

In his report on "The Basal Metabolism of Normal Men and Women", Takahira published his experimental results concerning the basal metabolism of 120 adult Japanese men and women. The experimental subjects varied in regard to their body size, age, profession and habits of life, and accordingly the basal metabolism varied considerably from individual to individual. It was noticed that the average basal metabolism in the group of labourers was higher than in the groups of merchants and teachers, engaged chiefly in mental work. This relation was the same in the case of the female subjects. It was a very interesting result, but the experimental data were too scanty to enable a definite conclusion to be drawn from them.

In 1923, the Social Bureau of the Tokyo City Office placed at our disposal 50 common labourers as experimental subjects, and thus we were able to determine the basal metabolism of exclusively physical labourers. Of 50 subjects, 30 were male and 20 female.

By "common labourers" are meant physical labourers without fixed jobs, usually working out of doors. The male subjects were rice polishers of the Army Commissary Department, labourers at sewer works, stone-cutters, coal-carriers, brick workers and jinrikisha men. The female subjects were working at sewing, straw cutting, and cooking in the Army Commissary Department. The ages of the subjects varied from 20 to 50 years.

The subjects were studied with the respiration apparatus for clinical use, the experimental procedure being the same as in the previous report. The experiments extended from February to April 1923. The body surface area was calculated from our new height-weight formula $A = W^{\cdot 427} \times H^{\cdot 718} \times 74.49$. The experimental results were as follows:

Table 1. — Basal Metabolism of Male Labourers.

Sujets Subject	Date de l'observation Day of observation	Age	Poids Body weight	Taille Body height	Superficie du corps Body surface	Consommation d'oxygène p. heure Oxygen consump. per hour	Production de CO^2 par heure Carbon dioxide Production p. hour	R. Q.	Elimination de N dans l'urine par heure Nitrogen excretion in urine per hour	Production de chaleur par heure Heat prduction per hour	Production de chaleur p. 24 h. Heat production per 24 hours	Production de chaleur p. kg. en 24 h. Heat per kilo per 24 hours	Production de chaleur p. m^2 et p. h. Heat per sq. m. per hour	Pouls Pulse rate	Respiration Respiration rate
		Yrs.	Kilos	cms.	sq. m.	l.	l.		gm.	cals.	cals.	cals.	cals.		
T. Ozaki	Apr. 21 Avril	20	57.3	161.2	1.61	15.07	11.35	0.75	0.4887	70.19	1684	29.4	43.59	40	15
Y. Naruse	» 16 »	22	57.0	160.2	1.60	13.41	11.70	0.87	0.5784	63.79	1531	26.9	39.87	59	14
M. Hatashima	» 24 »	22	56.5	155.0	1.56	13.85	11.63	0.84	0.5054	65.74	1578	27.9	42.14	42	15
S. Toda	» 23 »	23	62.2	155.3	1.63	13.03	11.29	0.87	0.4954	62.44	1499	24.1	38.31	47	14
K. Sato	» 19 »	23	60.5	164.7	1.68	14.63	13.12	0.90	0.4198	70.58	1694	28.0	42.01	57	17
M. Daito	» 20 »	23	54.7	153.0	1.53	13.53	10.64	0.79	0.4205	63.69	1528	24.9	41.62	52	16
T. Muto	» 13 »	29	60.6	169.8	1.71	13.87	12.03	0.87	0.5198	66.08	1586	26.2	38.64	58	13
H. Yanagisawa	Mar. 21 Mars	35	54.7	164.5	1.60	13.72	11.76	0.86	0.3760	65.65	1576	28.8	41.03	65	19
T. Tamura	Apr. 28 Avril	39	69.4	163.0	1.76	14.48	10.96	0.76	0.3567	67.68	1624	23.3	38.45	56	15
T. Akiyama	» 14 »	20	49.0	158.0	1.49	13.65	11.11	0.81	0.3244	64.22	1541	31.4	43.10	53	12
K. Nishimura	» 7 »	22	49 2	155.0	1.50	13.51	12.70	0.4	0.4504	65.98	1584	32.2	43.98	54	15
M. Higashi	» 10 »	24	53.1	148.0	1.50	12.08	11.36	0.94	0.3360	59.03	1417	26.7	39.36	60	16
H. Ono	Mar. 20 Mars	25	49.3	159.4	1 51	11.07	10.30	0 93	0.3163	53.92	1294	26.2	35.71	45	16
M. Hatanaka	» 27 »	26	49.6	159.5	1.50	11.51	20.68	0.92	0. 653	55.91	1341	27.1	37.27	58	17
Y. Nakao	Apr. 25 Avril	28	56.6	167.9	1.65	13.98	10.86	0.78	0.3956	65.69	1577	27.8	39.77	53	15
Y. Ki	Mar. 26 Mars	31	48.4	156.6	1. 7	12.93	10.47	0.81	0.3776	61.22	1469	30.4	41.65	58	18
F. Nakasone	Apr. 26 Avril	32	47.2	145.5	1.38	12.35	9.42	0.76	0.3871	57.82	1388	29.4	41.90	47	16
T. Taguchi	May 3 Mai	38	56.7	158.0	1.58	12.76	11.84	0 93	0.4200	62.00	1488	26.2	39.24	65	22
J. Nagai	Mar. 18 Mars	40	52.0	160.3	1.54	12.56	10.04	0.80	0.4597	58.92	1414	27.2	38.26	54	16
H. Yoshida	Apr. 27 Avril	40	47.2	151.0	1.35	11.68	8.76	0.75	0.4507	54.28	1303	27.6	40.21	42	16
N. Taguchi	» 12 »	42	51.4	154.4	1.49	13.54	10.14	0.75	0.4105	62.83	1508	29.3	42.37	51	17
S. Fujino	Mar. 19 Mars	44	47.6	154.0	1.44	11.66	10.04	0.86	0.5788	55.41	1330	27.9	38.48	58	15
S. Mitsumura	» 17 »	46	53.6	158.0	1.55	13.63	10.69	0.78	0.3832	64.12	1539	28.8	41.17	60	17
E. Wada	Apr. 11 Avril	46	46.8	160.0	1.47	12.66	9.72	0.77	0.3076	59.52	1428	30.5	40.49	59	16
M. Kanayama	Mar. 16 Mars	48	49.7	150.5	1.45	11.03	10.27	0.93	0.2426	54.05	1297	26.1	37.28	59	16
K. Horiuchi	May 2 Mai	49	51.4	165.0	1.60	14.00	11.82	0.84	0.4910	67.87	1639	30.1	42.42	57	18
D. Suga	Apr. 18 Avril	21	44.1	161.2	1.44	12.74	11.54	0.91	0.4523	61.55	1477	33.5	42.74	96	15
S. Nihira	Mar. 23 Mars	39	47.3	155.0	1.45	11.69	9.63	0.90	0.3428	51.81	1243	26.3	35.73	40	15
B. Adachi	» 24 »	38	44.6	152.0	1.39	10.69	10.88	0.93	0.4679	56.70	1360	30.5	40.79	64	16
D. Tsukada	» 15 »	42	46.2	150.0	1.40	11.47	9.84	0.86	0.3415	54.88	1316	28.5	39.20	76	18
Moyenne Average										64.45	1475	28.3	40.23	55	16

Table 2. — Basal Metabolism of Female Labourers.

Sujets Subject	Date de l'observation Day of observation	Age An. Yrs.	Poids Body weight kilos	Taille Body height cms.	Superficie du corps Body surface m^2 sq. m.	Consommation d'oxygène p. heure Oxygen consump. per hour l.	Production de CO^2 par heure Carbon dioxide production p. hour l.	R. Q.	Elimination de N. dans l'urine p. heure Nitrogen excretion in urine per hour gm.	Production de chaleur par heure Heat production per hour cals.	Production de chaleur p. 24 h. Heat production per 24 hours cals.	Production de chaleur p. kg. en 24 h. Heat per kilo per 24 hours cals.	Production de chaleur p. m^2 et p. h. Heat per sq. m. per hour cals.	Pouls Pulse rate	Respiration Respiration rate
T. Yoshida	Feb. 28 Févr.	27	50.2	145.0	1.41	10.33	9.33	0.90	0.1453	50.61	1215	24.2	35.89	59	10
I. Okawa	» 12 »	27	47.2	135.0	1.31	10.36	9.02	0.87	0.2567	49.74	1194	25.3	37.97	52	13
K. Hayakawa . . .	Mar. 1 Mars	34	62.4	154.0	1.62	13.79	10.86	0.79	0.2625	65.00	1560	25.0	40.12	66	19
S. Otaki.	Feb. 22 Févr.	43	52.9	148.0	1.47	12.22	10.08	0.82	0.2312	58.27	1390	26.5	39.64	77	20
H. Taguchi	» 24 »	43	50.0	151.0	1.46	9.18	7.92	0.86	0.2790	43.86	1053	21.1	30.04	49	15
J. Furuyama . . .	» 9 »	48	47.0	138.0	1.33	10.19	8. 6	0.85	0.2972	48.40	1169	24.8	36.62	55	17
K. Yanagihara. . .	» 20 »	20	43.5	142.2	1.31	9.54	9.07	0.95	0.4404	46.23	1110	25.5	35.29	69	18
T. Mase.	» 16 »	26	44.8	148.5	1.37	11.42	9.88	0.87	0.2828	54.77	1315	29.3	39.98	68	17
S. Ishiyama	» 27 »	28	38.6	143.0	1.25	10.42	8.39	0.81	0.1392	49.49	1188	30.8	39.59	62	14
H. Shimizu	» 7 »	29	42.8	148.5	1.34	8.67	8.36	0.96	0.3425	42.50	1020	23.9	31.71	59	15
K. Yamasaki . . .	Mar. 14 Mars	30	47.3	147.5	1.39	10.70	8.48	0.79	0.2924	50.04	1201	25.4	35.99	59	17
C. Sakai	» 13 »	37	41.6	151.0	1.34	9.64	3.68	0.90	0.4008	46.40	1114	26.8	34.69	60	10
T. Sugiura	» 5 »	40	43.1	136.9	1.27	10.18	9.16	0.90	0.2700	49.66	1192	27.7	39.11	61	13
O. Yamada	» 9 »	41	44.2	146.0	1.34	10.23	8.57	0.84	0.2015	49.12	1179	26.7	36.65	61	19
H. Hasegawa . . .	Feb. 21 Févr.	44	39.6	142.2	1.26	9.69	8.24	0.85	0.2627	46.36	1113	28.1	36.80	64	12
K. Ishii.	» 10 »	45	46.3	141.8	1.34	10.69	8.49	0.78	0.3612	50.31	1308	28.2	37.55	64	19
Y. Shiota	Mar. 10 Mars	46	38.7	139.0	1.23	8.57	6.94	0.81	0.3453	40.24	966	25.0	32.71	71	13
T. Suzuki	Feb. 13 Févr.	47	39.5	139.2	1.24	9.59	8.70	0.91	0.2783	46.47	1115	28.3	37.48	67	16
S. Takakura. . . .	» 23 »	48	44.9	149.5	1.38	10.15	7.71	0.75	0.4652	47.05	1029	22.9	34.09	82	20
M. Itakura	» 8 »	47	37.8	135.4	1.16	9.19	7.78	0.85	0.2941	43.72	1049	27.8	36.74	48	17
Moyenne Average . .		37.5	43.1	143.6	1.34	10.24	8.72	0.85	0.2924	48.93	1174	26.2	36.43	63	16

The average measurements of the 30 male subjects were 157.9 cms. body height 52.46 kgms. body weight, 1.53 sq. m. body surface, and the average age was 32.5 years. The average basal heat production was 1,475 calories; the average respiratory quotient was 0.85, the average pulse rate was 55 and the respiration rate was 16.

The average measurements of the 20 female subjects were 143.6 cms. body height, 43.12 kgms. body weight, 1.34 sq. m. body surface, and the average age was 37.5 years. There was an average heat production of 1,174 calories; the average respiratory quotient was 0.85, the average pulse rate was 63 and the respiration rate was 16.

Comparing these results with Takahira's results obtained with 120 normal men and women, we found no significant difference in the average value of the physical characters of the subject, nor in the respiratory quotient, the pulse rate, nor in the respiration rate. There was, however, a slight difference in the basal metabolism in the two experiments.

The basal metabolism of common labourers per square meter per hour in men averaged 40.23 calories, which was higher than the normal average of 37.33 by 7.21 per cent. The basal metabolism in women averaged 36.43 calories, which was also higher than the normal average of 33.84 calories by 7.11 per cent. This relation is charted in Charts 1 and 2.

For this comparison we calculated the basal metabolism by the three prediction methods mentioned in the previous report.

[*See Table 3 and Charts Nos. 1 and 2 on pages 41 and 42.*]

The results of the three calculations are as follows:

	First method	Second method	Third Method	Average
Male	+ 7.61 %	+ 8.07 %	+ 9.02 %	+ 8.23 %
Female	+ 7.49 %	+ 11.53 %	+ 11.42 %	+ 10.15 %

The basal metabolism of common labourers as compared with the normal standard is higher in males by 8.23 per cent, and in females by 10.15 per cent.

The reason for this difference is that, in physical labour, the metabolism is increased and the after-effect of daily physical work is continued throughout the experimental period. In order to find the true minimal value of the basal metabolism the determination should be made after many days of fasting and muscular repose.

Benedict, Emmes, Roth and Smith studied the basal metabolism of athletes and men of sedentary life, and found that in athletes the metabolism was 7 per cent higher than in men of less active life. This result is quite in accordance with our own.

It is necessary to bear in mind that, besides the body height, body weight, body surface area, age and sex, there is another important factor influencing the basal metabolism — that is, the profession or mode of living of the subjects, particularly as regards their muscular activity.

Chart 1. — Basal Metabolism of Male Labourers.

Each dot represents individual values, the straight line shows the normal basal metabolic rate.

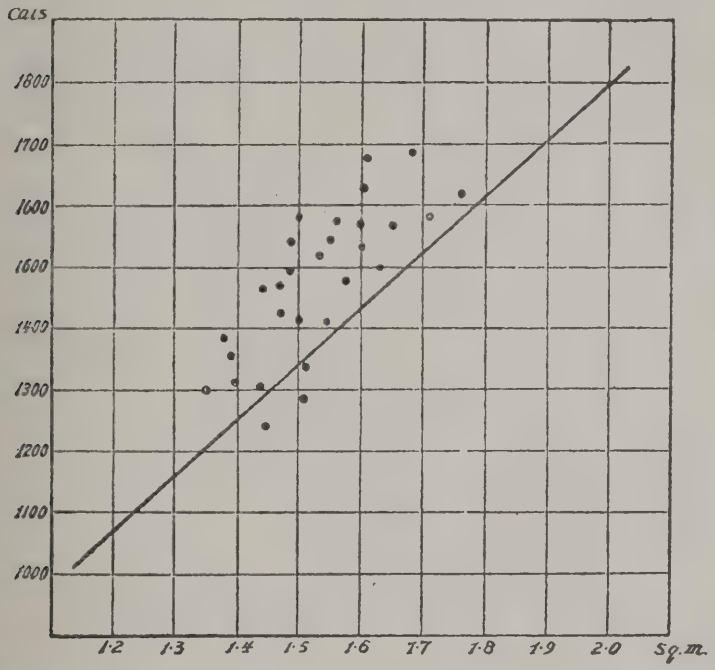


Chart 2. — Basal Metabolism of Female Labourers.

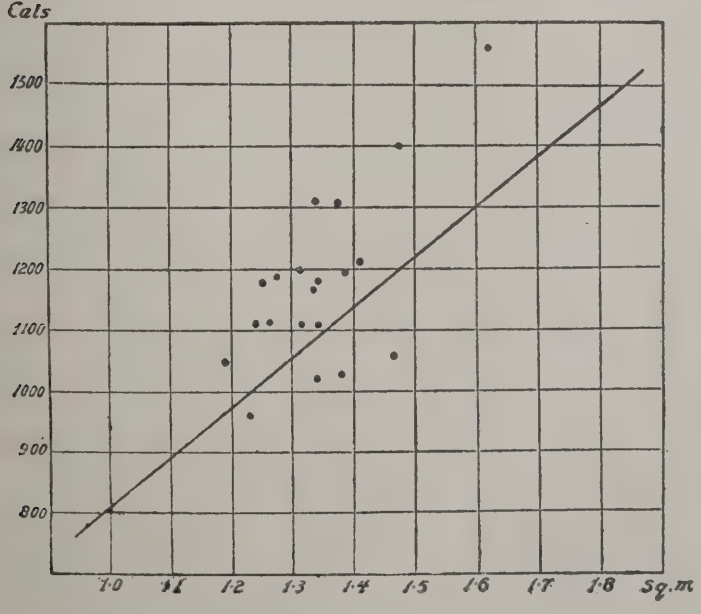


Table 3. — Comparison of Basal Metabolism of Labourers with the Predicted Normal Value.

Sujets Subject	Méth. I First Method	Méth. II Second Method	Méth. III Third Method
T. Ozaki	+ 14.3	+ 17.0	+ 12.2
Y. Naruse	+ 4.9	+ 7.4	+ 3.6
M. Hatashima	+ 10.8	+ 13.4	+ 7.1
S. Tada	+ 10.1	+ 1.0	— 2.5
K. Sato	+ 10.8	+ 15.3	+ 12.0
M. Daido	+ 9.7	+ 11.7	+ 6.7
T. Muto	+ 2.7	+ 6.9	+ 8.0
H. Yanagisawa	+ 9.9	+ 12.3	+ 13.2
T. Tamura	+ 3.6	+ 10.9	+ 7.5
T. Akiyama	+ 13.0	+ 12.1	+ 11.0
K. Nishimura	+ 15.7	+ 17.1	+ 15.5
M. Higashi	+ 3.7	+ 6.9	+ 0.6
H. Ono	— 5.6	— 5.7	— 4.2
M. Hatanaka	— 1.6	— 2.3	— 0.5
Y. Nakao	+ 5.6	+ 8.5	+ 10.6
Y. Ki	+ 11.0	+ 10.1	+ 12.9
F. Nakasone	+ 11.7	+ 10.3	+ 8.5
T. Taguchi	+ 5.4	+ 8.8	+ 8.6
J. Nagai	+ 3.1	+ 4.7	+ 8.5
H. Yoshida	+ 8.3	+ 2.6	+ 4.9
N. Taguchi	+ 13.9	+ 15.3	+ 17.2
S. Fujino	+ 4.2	+ 4.0	+ 8.0
S. Mitsumura	+ 12.3	+ 15.7	+ 18.5
E. Wada	+ 9.9	+ 9.3	+ 17.6
M. Kanayama	+ 1.5	+ 3.0	+ 4.3
K. Horiuchi	+ 15.8	+ 9.8	+ 29.1
D. Suga	+ 12.4	+ 8.2	+ 12.9
S. Nihira	— 4.1	— 4.6	+ 1.0
B. Adachi	+ 9.5	+ 7.3	+ 11.9
D. Tsukada	+ 5.8	+ 5.0	+ 7.8
Moyenne Average	+ 7.61	+ 8.07	+ 9.02

Sujets Subject	Méth. I First Method	Méth. II Second Method	Méth. III Third Method
T. Yoshida	+ 4.8	+ 10.5	+ 5.2
I. Okawa	+ 10.9	+ 13.2	+ 6.6
K. Hayakawa	+ 18.2	+ 36.0	+ 25.0
S. Otaki	+ 18.6	+ 29.4	+ 25.7
H. Taguchi	— 10.2	— 2.2	— 2.8
J. Furuyama	+ 10.2	+ 13.9	+ 13.1
K. Yanagihara	+ 1.0	+ 3.7	+ 0.7
T. Mase	+ 16.5	+ 21.8	+ 14.3
S. Ishiyama	+ 15.7	+ 14.2	+ 18.0
H. Shimizu	— 7.1	— 4.4	— 3.3
K. Yamasaki	+ 5.5	+ 11.2	+ 8.1
C. Sakai	+ 2.7	+ 5.6	+ 10.5
T. Sugiura	+ 16.3	+ 16.6	+ 17.4
O. Yamada	+ 9.3	+ 12.7	+ 15.1
H. Hasegawa	+ 10.1	+ 9.7	+ 15.8
K. Ishii	+ 12.4	+ 25.9	+ 26.0
Y. Shiota	— 1.8	— 3.4	+ 2.4
T. Suzuki	+ 12.7	+ 11.3	+ 17.2
S. Takakura	— 6.5	— 1.6	+ 1.9
M. Itakura	+ 10.5	+ 6.4	+ 12.8
Moyenne Average	+ 7.49	+ 11.53	+ 11.42

3.

ON THE ENERGY EXCHANGE IN THE VARIOUS INDUSTRIAL OCCUPATIONS

By Kōtaro Takahashi

(From the Laboratory of Industrial Efficiency, the Department of Commerce and Industry).

The author has studied the energy exchange in men engaged in various industrial occupations. The experiments were carried out by means of a mouth-piece, nose clip, Douglas bag, and Haldane gas analysis apparatus. The principal findings were as follows:

1. Considering the energy value in standing as 100, the energy exchange in the various occupations was as in Table 1 (the subjects used comprised 45 men and 20 women).

Table 1. — Energy Value in Various Occupations

Kind of Labours	Standing (men)	Watch-making	Calculating with an Abacus	Lathe Work	Finishing Work	Furnace Work	Hand-smith Work	Firemen's Work	Standing (women)	Reeling Work	Twist Work	Investigating Work	Patch Work
Subjects used in experiment	31	5	9	13	6	3	4	5	13	7	5	4	4
Oxygen consumption per hour (l).	10.91	9.90	11.23	20.86	36.01	43.70	51.17	53.16	9.06	10.00	14.11	14.50	16.10
Energy Value	100	91	103	191	330	400	469	487	100	110	156	160	178

2. The oxygen consumption immediately after the work is finished is considerably greater than during the period before the work was begun. This increase is proportional to the severity of the work. The increased quantity of oxygen consumed must, of course, be added to the oxygen consumed during work.

Table 2. — Oxygen Consumption before, during and after Work (Silk-spinning Work).

Subject	Oxygen consumption per min. (c.c.)				Oxygen consumption (comparison)			
	Before work	During work	Directly after work	1 min. after work	Before work	During work	Directly after work	1 min. after work
Y. T.	201.1	783.0	381.6	245.2	100	389	190	126
I. O.	210.8	641.2	341.5	236.2	100	304	162	112

Table 3. — Oxygen Consumption before, during and after Walking and Running (c.c. per min.).

Subject	Before walking	During walking	After walking	Distance (m.)	During running	After running	Distance (m.)
S. T.	272.3	834.9	364.2	60.3	1053.8	451.6	79.2
K. T.	226.6	769.1	370.3	78.0	1186.3	436.9	120.0
K. T.	243.6	722.2	214.4	75.9	1450.4	911.0	153.4

3. The oxygen consumption varies at different periods during the day work. Gas analysis experiments were carried out at 10 a.m., 11.30 a.m., 1 p.m 2.30 p.m., and 4 p.m.; 48 experiments were undertaken as follows:

20 experiments type 1
12 » » 2
6 » » 3
6 » » 4
4 » » 5

Chart 1. — Oxygen Consumption before, during and after Work.

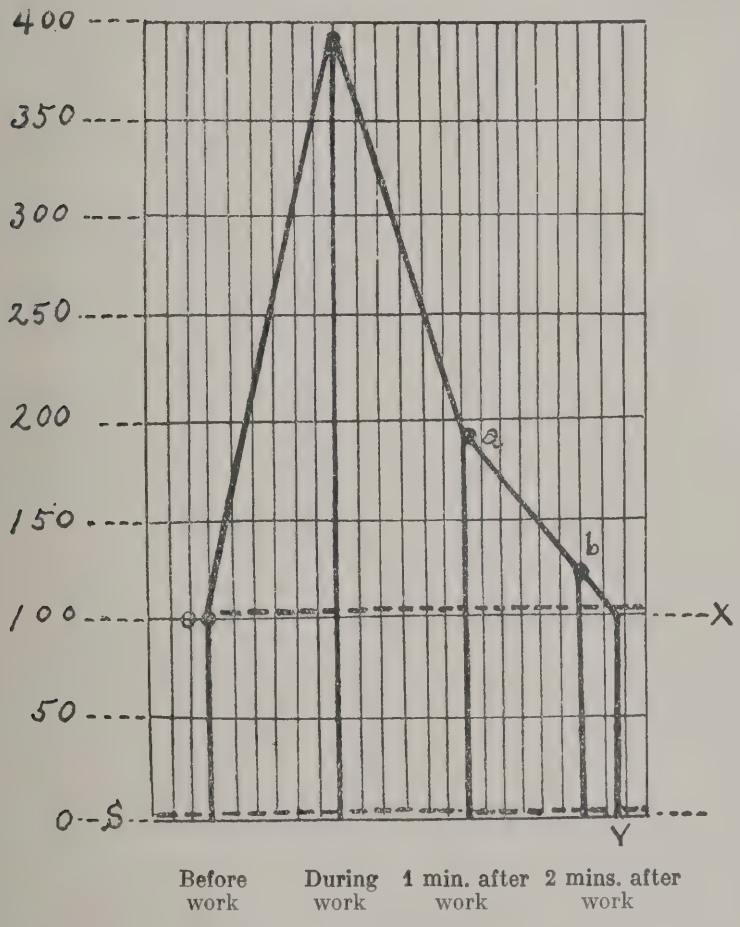


Chart 2. — Type 1, No. 1.

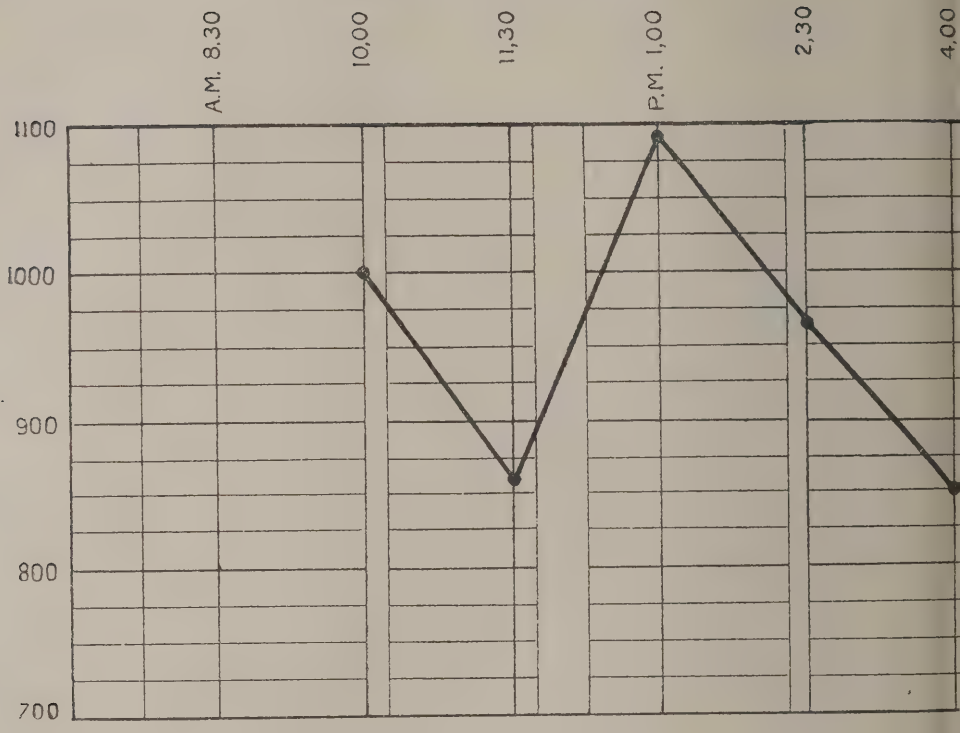


Chart 3. — Type 1, No. 2.

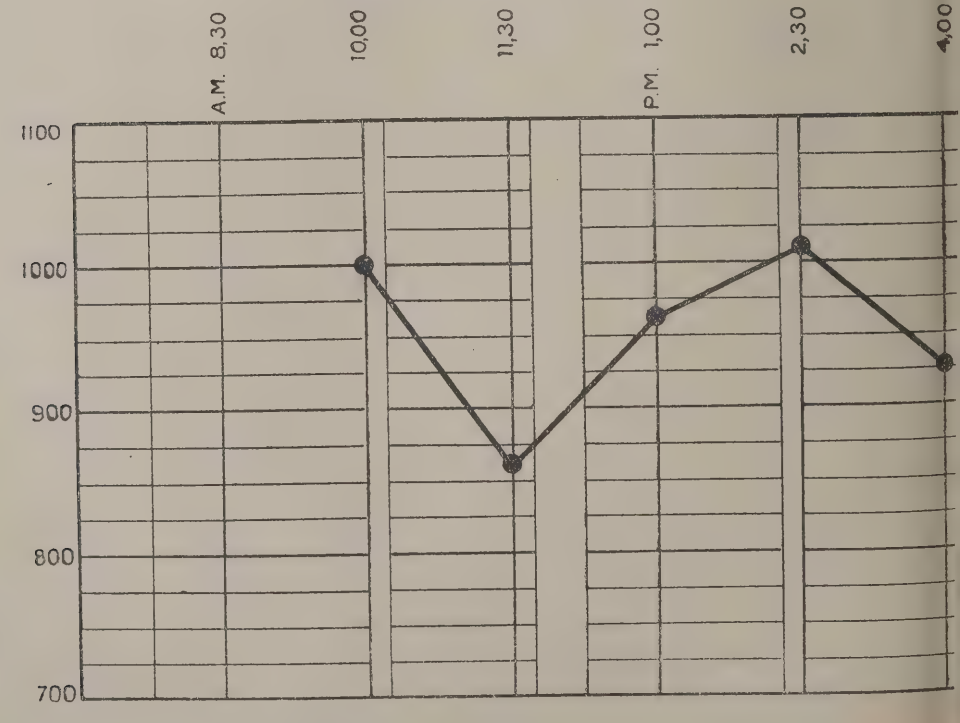


Chart 4. — Type 2.

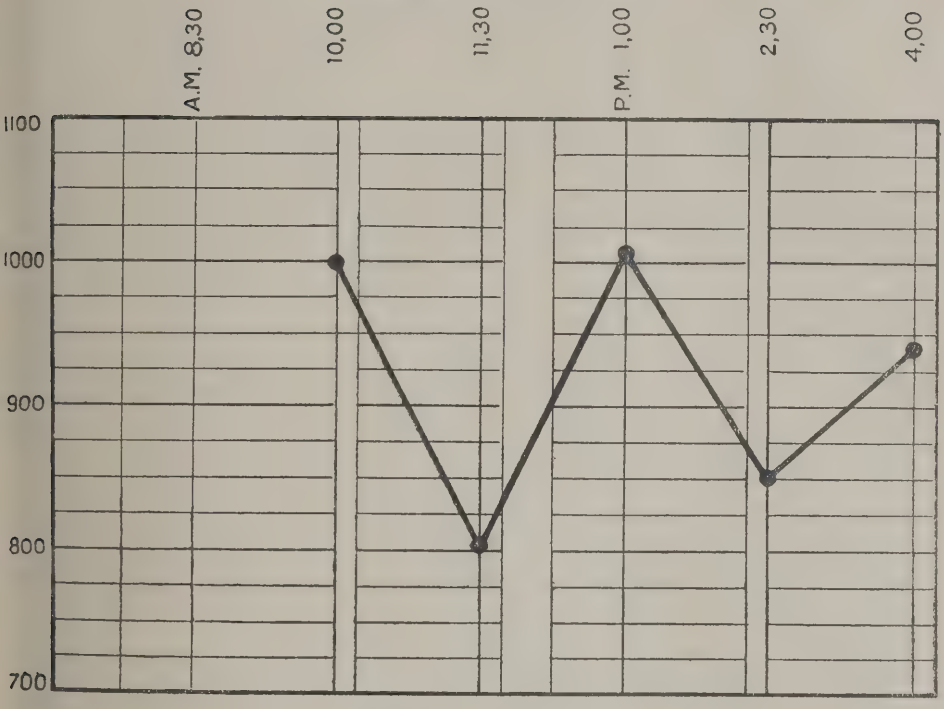


Chart 5. — Type 3.

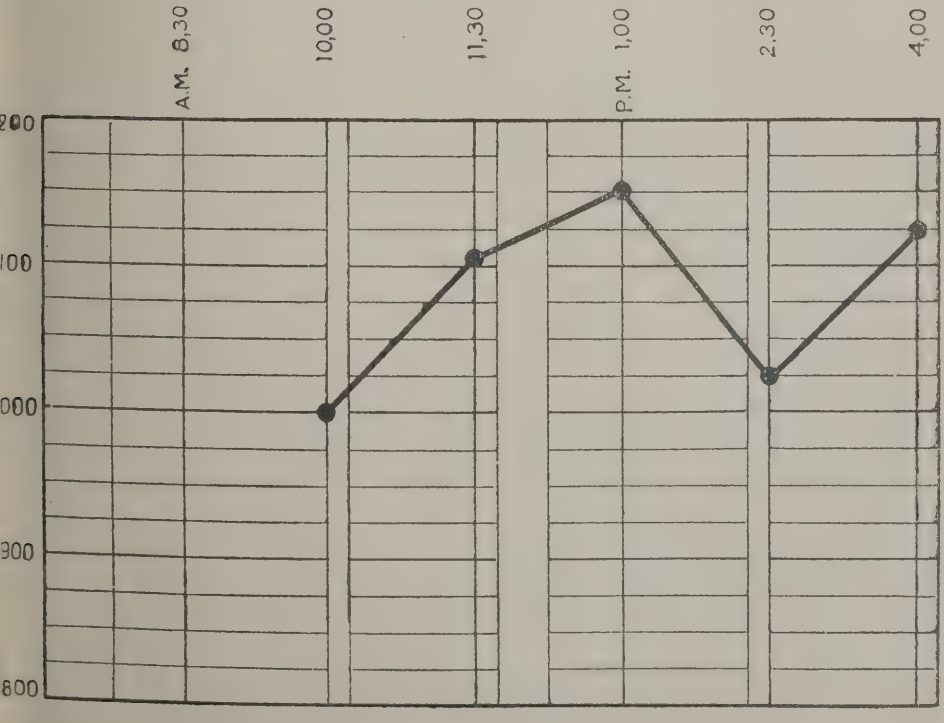


Chart 6. — Type 4.

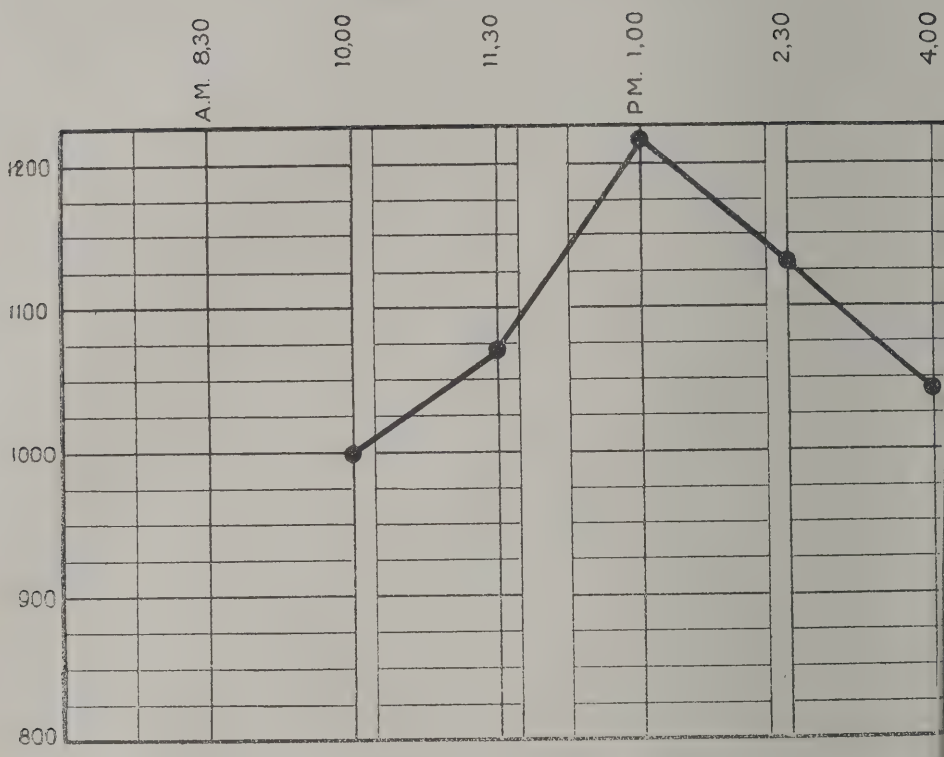
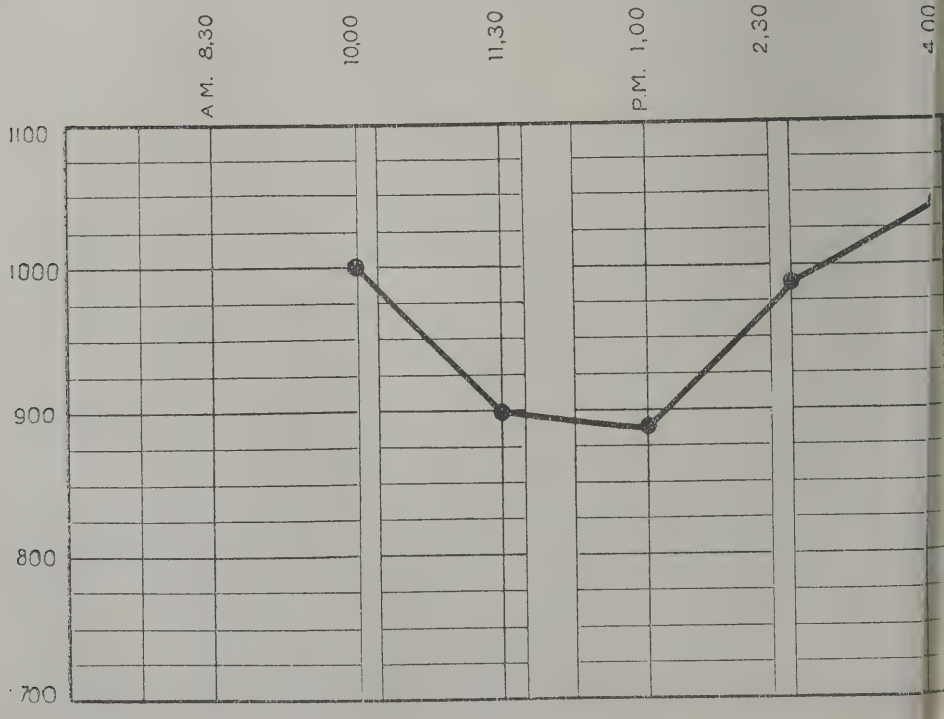


Chart 7. — Type 5.



4.

THE MEASUREMENT OF THE BODY SURFACE AREA OF MAN.

By Hideo Takahira

(From the Imperial State Institute for Nutrition, Tokyo).

1. Introduction.

It has been recognised since the experiments of Rubner that the body surface area is the most suitable measurement from which to calculate metabolism. The formula of Meeh, by means of which the body surface area may be calculated from the body weight, was used in metabolic researches for a long time. Eugene F. Du Bois, however, disputed the accuracy of the Meeh formula and found that it had an average error of + 15 per cent, and a maximum error of + 30 per cent.

Eugene F. Du Bois, in collaboration with Delafield Du Bois, devised the linear formula in 1915 and the height-weight formula in 1916. With these formulæ, they could estimate the body surface area with an average error of ± 1.5 per cent, and a maximum error of ± 5 per cent.

In the study of the basal metabolism of Japanese men and women, I used the Du Bois height-weight formula to calculate the body surface area and I expressed the metabolism as a function of the surface unit. However, it requires to be proved whether or not the height-weight formula is applicable in the case of the Japanese, where the ratio of trunk measurement to that of the extremities is different from that of European races. In order to examine the applicability of the height-weight formula and other formulæ to Japanese subjects, I performed the following experiment.

2. Experimental Procedure.

The body surface area of ten men was measured. The method of measurement consisted in making a thin paper mould of the body, cutting this up in small pieces which would lie flat and measuring the area of the paper pieces by Amsler's planimeter. This somewhat resembles the Du Bois' method, but is modified in various points.

The subject's hair was first cut close to the head and then he bathed. He was weighed, placed on a flat table and all the measurements were made. A staple tape was used for all the linear measurements and a cloth tape for the circumferences.

The boundaries of the anatomical regions of the head, trunk, arms, hands, legs and feet were marked with black enamel on the skin.

The material used to cover the body was a very thin and strong paper called Gampishi. If this paper is moistened, it is possible to make it fit very easily even over the fingers, toes and ears. In order to apply the paper closely to the skin, a Japanese writing brush was used. The paper was cut into various shapes and sizes previous to its application.

The paper was pasted on the nude body first with water, then with 1 per cent Shofu starch paste and was then dried with a fan. The holes of the nose and ears were left uncovered. The penis and scrotum were not covered; their surface area was calculated from linear measurements.

When the paper covering (consisting of a double layer of Gampishi over the skin) was dry, it was removed. This mould of the body was then cut into small pieces with scissors and their surface area was measured with Amsler's planimeter No. 4.

The average error of the planimeter per individual measurement was 0.2 per cent and was neglected. To determine the error due to the shrinkage of the paper mould, I pasted some of the paper over the surface of a large rubber balloon. The diameter of the balloon was 21.269 cms., as determined by 20 measurements made with a Universal measuring machine. The theoretical surface area worked out at 1421.17 sq. cms. Ten coverings were made and the error due to the shrinkage of the paper was found to average —1.1 per cent. This percentage of error was corrected in the body surface measurement of each man.

Table 1. — Surface Area of Rubber Balloon.

Expérience N° No. of Experiment	Superficie mesurée (cm^3) Surface area measured (sq. cm.)	Ecart de la superficie moyenne Difference from mean value	Ecart % Difference %	Ecart de la superficie calculée Difference from theoretical value	Ecart % Difference %
1	1404.6	—0.87	—0.06	—15.6	—1.10
2	1409.1	+3.63	+0.26	—12.1	—0.85
3	1405.2	—0.27	—0.02	—16.0	—1.19
4	1400.3	—5.17	—0.37	—20.9	—1.40
5	1404.1	—1.37	—0.10	—16.8	—1.18
6	1402.1	—3.37	—0.24	—19.1	—1.34
7	1412.1	+7.33	+0.52	— 9.0	—0.63
8	1399.5	—5.97	—0.43	—21.7	—1.53
9	1409.4	+3.93	+0.28	—11.8	—0.83
10	1407.6	+1.13	+0.15	—13.6	—0.96
Moyenne Average	1405.5	—	±0.24	—17.3	—1.10

The differences between Du Bois' methods and mine are as follows:

1. Du Bois' paper mould was made over the underwear, socks and cotton gloves, and the surface area of the ears, genitals, fingers and toes were not measured accurately. I made a thin paper mould of the whole nude body except the genitals.

2. Du Bois measured the surface area of the pieces of the paper mould by printing the patterns of these pieces on photographic paper. In my experience this method gives a relatively large error, so I used a planimeter.

3. While Du Bois did not correct for the shrinkage of the paper mould, I made a correction of —1.1 per cent.

3. Experimental Results.

Ten men were measured. The subjects were members or employees of the Institute. The measurements were made from July to October 1923. The age, body weight, body height, body shape, and the actually measured body surface area are presented in Table 2.

The surface area of each portion of the body and its proportion of the total area are shown in Tables 3 and 4.

We found the surface area of the head, trunk, arms, hands, legs and feet averaged 10, 25, 14, 6, 38, and 7 per cent respectively of the total surface area of the body.

Table 2. — Age, Weight, Height and Surface Area measured of the Subjects.

Sujets Subject	Age Années Years	Poids kgs Weight kg.	Taille cm. Height cm.	Superficie $cm.^2$ Surface area sq. cm.	Description du corps Body form
Takahira .	28	51.00	169.60	15923	grand, mince — tall, thin.
Kitagawa .	26	49.50	160.15	14964	normal.
Ishibashi .	22	48.00	162.60	14913	normal.
Kayano .	22	50.10	151.80	14647	modérément gras — moderately fat.
Shimizu . .	18	55.60	163.00	16010	normal.
Tanaka . .	18	41.30	156.50	14593	normal.
Kato . . .	19	55.90	161.50	15621	gros — fat.
Ogishima .	53	51.20	156.20	15425	normal.
Nakamura.	54	37.30	149.60	12793	petit, mince — short, thin.
Kawaguchi	58	50.80	161.90	15304	normal.

Table 3. — Surface Area of the Individual Body Portion.

Sujets Subject	Tête Head	Torse Trunk	Bras Arms	Mains Hands	Jambes Legs	Pieds Feet	Total Totals
Takahira	1555	3973	2323	892	6028	1152	15923
Kitagawa	1473	3637	2117	809	5837	1091	14964
Ishibashi	1514	3774	2187	813	5581	1044	14913
Kayano	1480	3517	2238	731	5631	1050	14647
Shimizu	1464	3732	2244	923	6401	1246	16010
Tanoka	1485	3370	2157	862	5579	1140	14593
Kato	1464	4081	2261	851	5892	1072	15621
Ogishima	1509	4041	2296	870	5608	1101	15425
Nakamura	1444	3138	1832	799	4617	963	12793
Kawaguchi	1484	4099	2177	863	5599	1082	15304

Table 4. — Percentage of the Surface Area of the Individual Body Portion.

Sujets Subject	Tête Head	Torse Trunk	Bras Arms	Mains Hands	Jambes Legs	Pieds Feet	Total Totals
Takahira	10	25	14	6	38	7	100
Kitagawa	10	25	14	5	39	7	100
Ishibashi	10	25	15	5	38	7	100
Kayano	10	24	15	5	39	7	100
Shimizu	9	23	14	6	40	8	100
Tanaka	10	23	15	6	38	8	100
Kato	9	26	14	6	38	7	100
Ogishima	10	26	15	6	36	7	100
Nakamura	11	25	14	6	36	8	100
Kawaguchi	10	27	14	6	36	7	100
Moyenne Average	10	25	14	6	38	7	100

4. Applicability of Various Formulæ for Computing Surface Area to our Experimental Results.

I subsequently tested the applicability of the various formulæ for estimating the approximate surface area of the body, in the light of actual measurements of the body surface area.

A. *Formulæ for estimating the Body Surface Area from the Body Weight only.*

When the results of actual measurement are applied to Meeh's formula $A = W^{\frac{2}{3}} \times 12.3$, there is an average error of + 9.26 per cent, and a maximal error of + 13.13 per cent. The error is very great and usually positive.

Table 5. — Error of Meeh's Formula (1).

Sujets Subject	Superficie (cm^2.) Surface area sq. cm.	$W^{\frac{2}{3}} \times 12.3$	Difference	Difference %
Takahira	15923	16913	+ 990	+ 5.85
Kitagawa	14964	16580	+ 1616	+ 9.14
Ishibashi	14913	16248	+ 1335	+ 8.22
Kayano	14647	16716	+ 2069	+ 12.38
Shimizu	16010	17921	+ 1911	+ 10.66
Tanaka	14593	15867	+ 1274	+ 8.03
Kato	15621	17983	+ 2362	+ 13.13
Ogishima	15425	16962	+ 1537	+ 9.06
Nakamura.	12793	13727	+ 934	+ 6.80
Kawaguchi	15304	16876	+ 1572	+ 9.32
Moyenne — Average	—	—	—	+ 9.26

When 11.15 was used as the constant in the formula $A = W^{\frac{2}{3}} \times C$, the average error was ± 1.91 per cent and the maximum error ± 3.80 per cent. The error was now considerably less; the error is usually negative in a thin man and positive in a fat man. The Meeh formula is therefore not applicable for estimating the body surface area.

Table 6. — Error of Meeh's Formula (2).

Sujets Subject	C	Superficie Surface area	$W^{\frac{2}{3}} \times 11.15$	Difference	Difference %
Takahira	11.58	15923	15340	— 583	— 3.80
Kitagawa.	11.10	14964	15038	+ 74	+ 0.49
Ishibashi	11.29	14913	14732	— 181	— 1.23
Kayano	10.78	14647	15159	+ 512	+ 3.38
Shimizu	10.99	16010	16249	+ 239	+ 1.47
Tanaka	11.32	14593	14382	— 211	— 1.47
Kato.	10.69	15621	16305	+ 686	+ 4.21
Ogishima	11.19	15425	15380	— 45	— 0.29
Nakamura	11.46	12793	12452	— 341	— 2.74
Kawaguchi	11.16	15304	15300	—	— 0.03
Moyenne — Average	11.15	—	—	—	+ 1.91

B. *Formula for estimating the Body Surface Area from the Body Height and Body Weight.*

1. Lissauer's formula, $A = \frac{W}{H} \times C$, using the constant 48.48, gives an average error of ± 4.32 per cent, and a maximum error of ± 9.22 per cent.

Table 7. — Error of Lissauer's Formula.

Sujets Subject	C	Superficie Surface area	$\frac{W}{H} \times 48.48$	Difference	Difference %
Takahira	52.95	15923	14578	— 1345	— 9.22
Kitagawa.	48.41	14964	14984	+ 20	+ 0.14
Ishibashi	50.52	14913	14311	— 602	— 4.20
Kayano	44.38	14647	16000	+ 1353	+ 8.46
Shimizu	46.94	16010	16537	+ 527	+ 3.18
Tanaka	49.33	14593	14343	— 251	— 1.75
Kato.	45.13	15621	16780	+ 1150	+ 6.91
Ogishima	47.06	15425	15891	+ 466	+ 2.93
Nakamura	51.31	12793	12088	— 706	— 5.84
Kawaguchi	48.77	15304	15212	— 93	— 0.61
Moyenne — Average	48.48	—	—	—	± 4.32

2. $A = H \times W^{\frac{1}{3}} \times C$, with the constant 25.69, gave an average error of ± 1.37 per cent, and a maximum error of ± 3.53 per cent.

Table 8. — Error of the Formula $A = H \times W^{\frac{1}{3}} \times C$.

Sujets Subject	C	Superficie Surface area	$H \times W^{\frac{1}{3}} \times 25.69$	Difference	Difference %
Takahira	25.32	15923	16157	+ 234	+ 1.45
Kitagawa.	25.45	14964	15106	+ 142	+ 0.94
Ishibashi	25.24	14913	15180	+ 1267	+ 1.76
Kayano	26.17	14647	14376	— 271	— 1.89
Shimizu	25.74	16010	15982	— 28	— 0.18
Tanaka	25.97	14593	14436	— 157	— 1.09
Kato.	25.30	15621	15863	+ 242	+ 1.53
Ogishima	26.60	15425	14900	— 525	— 3.53
Nakamura	25.60	12793	12840	+ 47	+ 0.37
Kawaguchi	25.52	15304	15403	+ 99	+ 0.64
Moyenne — Average	25.69	—	—	—	± 1.37

3. When Du Bois' linear formula, $A = H^{\frac{1}{2}} \times W^{\frac{1}{2}} \times 167.2$ was applied to the results of the actual measurement, the average error was ± 1.56 per cent, and the maximum error ± 3.16 per cent. With a constant of 169.2 the error was smaller, the average being ± 1.14 per cent, and the maximum ± 2.82 per cent.

Table 9. — Error of Du Bois' Linear Formula (1).

Sujets Subject	Superficie Surface area	$H^{\frac{1}{2}} \times W^{\frac{1}{2}} \times 167.2$	Difference	Difference %
Takahira	15923	15650	— 373	— 2.40
Kitagawa	14964	14885	— 79	— 0.53
Ishibashi	14913	14772	— 141	— 0.97
Kayano	14647	14581	— 66	— 0.45
Shimizu	16010	15917	— 93	— 0.58
Tanaka	14593	14233	— 360	— 2.53
Kato	15621	15887	+ 266	+ 1.67
Ogishima	15425	14953	— 472	— 3.16
Nakamura.	12793	12490	— 303	— 2.43
Kawaguchi	15304	15168	— 136	— 0.90
Moyenne — Average	—	—	—	± 1.56

Table 10. — Error of Du Bois' Linear Formula (2).

Sujets Subject	C	Superficie Surface area	$H^{\frac{1}{2}} \times W^{\frac{1}{2}} \times 169.2$	Difference	Difference %
Takahira	171.21	15923	15735	— 188	— 1.20
Kitagawa.	167.36	14964	15127	+ 163	+ 1.08
Ishibashi	168.81	14913	14947	+ 34	+ 0.22
Kayano	167.96	14647	14754	+ 107	+ 0.73
Shimizu	168.18	16010	16106	+ 96	+ 0.60
Tanaka	171.43	14593	14102	— 192	— 1.33
Kato.	164.41	15621	16075	+ 454	+ 2.82
Ogishima	172.48	15425	15130	— 295	— 1.90
Nakamura	171.26	12793	12638	— 155	— 1.23
Kawaguchi	168.75	15304	15343	+ 39	+ 0.25
Moyenne — Average	169.18	—	—	—	± 1.14

4. Using Du Bois' height-weight formula, $A = H^{.725} \times W^{.425} \times 71.84$, the average error was ± 1.28 per cent, and the maximum error ± 3.50 per cent. With a constant of 72.46, the average error was ± 0.95 per cent, and the maximum error ± 2.64 per cent.

Table 11. — Error of Du Bois' Height-Weight Formula (1).

Sujets Subject	Superficie Surface area	$W^{.425} \times H^{.725} \times 71.84$	Difference	Difference %
Takahira	15923	15790	— 133	— 0.84
Kitagawa	14964	14951	— 13	— 0.09
Ishibashi	14913	14927	+ 14	+ 0.09
Kayano	14647	14459	— 188	— 1.30
Shimizu	16010	15916	— 94	— 0.59
Tanaka	14593	14099	— 494	— 3.50
Kato	15621	15847	+ 226	+ 1.43
Ogishima	15425	14915	— 51	— 3.42
Nakamura.	12793	12652	— 141	— 1.11
Kawaguchi	15304	15243	— 61	— 0.40
Moyenne — Average	—	—	—	± 1.28

Table 12. — Error of Du Bois' Height-Weight Formula (2).

Sujets Subject	C	Superficie Surface area	$W^{.425} \times H^{.725} \times 72.46$	Difference	Difference %
Takahira	72.439	15923	15926	+ 4	+ 0.03
Kitagawa.	71.872	14964	15085	+ 121	+ 0.80
Ishibashi	71.775	14913	15054	+ 141	+ 0.94
Kayano	72.761	14647	14586	— 62	— 0.42
Shimizu	72.260	16010	16053	+ 43	+ 0.27
Tanaka.	73.325	14593	14420	— 173	— 1.20
Kato.	70.816	15621	15983	+ 361	+ 2.26
Ogishima	74.365	15425	15029	— 396	— 2.64
Nakamura	72.807	12793	12731	— 62	— 0.49
Kawaguchi	72.129	15304	15373	+ 69	+ 0.45
Moyenne — Average	72.455	—	—	—	± 0.95

C. *Formulæ for estimating the Body Surface from the Body Height, Body Weight and Circumference of the Trunk.*

1. Stöltzner-Miwa formula $\frac{UHW}{\sqrt[6]{H^2W^4U^2}} \times C$. Stöltzner and Miwa introduced the circumference of the chest as a factor in the measurement of the body surface. With a constant of 40.42 the average error was ± 1.28 per cent, and the maximum error ± 3.62 per cent.

Table 13. — Error of Stöltzner-Miwa's Formula.

Sujets Subject	C	Superficie Surface area	$\frac{UHW}{\sqrt[6]{H^2W^4U^2}} \times 40.42$	Difference	Difference %
Takahira	41.435	15923	15534	— 389	— 2.50
Kitagawa.	40.935	14964	14777	— 187	— 1.26
Ishibashi	41.095	14913	14669	— 244	— 1.66
Kayano	39.144	14647	15126	+ 479	+ 3.17
Shimizu	39.878	16010	16229	+ 219	+ 1.35
Tanaka	40.618	14593	14523	— 70	— 0.48
Kato.	38.929	15621	16208	+ 587	+ 3.62
Ogishima	41.631	15425	14978	— 447	— 2.99
Nakamura	40.376	12793	12808	+ 15	+ 0.12
Kawaguchi	40.169	15304	15401	+ 97	+ 0.63
Moyenne — Average	40.424	—	—	—	± 1.78

2. Bouchard's formula, $A = C_1 LH + C_2 \frac{H}{L} + C_3 H \sqrt{\frac{W}{\pi H}}$. In this formula, the symbol L signifies the circumference of the waist. Applying the experimental results, I obtained for the three constants, C_1, C_2, C_3, the values of 0.386, 8.239, 3.162 respectively. When these constants were applied in the formula, the average error was ± 1.12 per cent, and the maximum error ± 2.91 per cent.

Table 14. — Error of Bouchard's Formula.

Sujets Subject	C_1	C_2	C_3	Superficie Surface area	$C_1LH+C_2\frac{H}{L}+C_3H\sqrt{\frac{W}{\pi H}}$	Diff.	Diff. %
Takahira . . .	0.384	8.482	3.199	15923	15745	— 178	— 1.13
Kitagawa . .	0.387	8.112	3.140	14964	15072	+ 108	+ 0.72
Ishibashi . . .	0.377	8.389	3.154	14913	14957	+ 44	+ 0.29
Kayano . . .	0.395	7.942	3.138	14647	14766	+ 119	+ 0.81
Shimizu . . .	0.376	8.351	3.142	16010	16117	+ 107	+ 0.65
Tanaka . . .	0.391	8.352	3.203	14593	14409	— 184	— 1.28
Kato	0.388	7.731	3.072	15621	16090	+ 469	+ 2.91
Ogishima. . .	0.399	8.285	3.223	15425	15139	— 286	— 1.80
Nakamura . .	0.385	8.460	3.200	12793	12646	— 147	— 1.16
Kawaguchi .	0.382	8.285	3.153	15304	15352	+ 48	+ 0.31
Moyenne Average.	0.386	8.239	3.162	—	—	—	± 1.12

D. *Geometrical Measurement.*

The linear measurements of the body were made with the subjects lying on a flat table. The surface area of each portion of the body was expressed as the product of the circumference, length and a constant. The following measurements were made:

A — circumference passing vertex and point of chin.
B — coronal circumference around occiput and forehead, just above eyebrows.
F — tip of acromial process to lower border of radius, measured with forearm extended.
G — circumference at level of upper border of axilla.
H — largest circumference of forearm.
I — smallest circumference of forearm.
J — lower posterior border of radius to tip of second finger.
K — circumference of open hand at the metacarpo-phalangeal joints.
L — suprasternal notch to upper border of pubes.
M — circumference of abdomen at level of umbilicus.
N — circumference of thorax at level of nipples in the male, and just above the breasts in the female.

O — superior border of great trochanter to the lower border of the patella
P — circumference of thigh just below the level of the perineum.
Q — circumference of hips and buttocks at the level of the great trochanters.
W — upper border of pubes to lower border of the patella.
R — from sole of foot to lower border of patella.
S — circumference at level of lower border of patella.
T — length of foot including great toe.
U — circumference of foot at base of little toe.
V — smallest circumference of ankle.

The value of each linear measurement is represented in Table 15.

The surface area of the various parts of the body is expressed in the following formulæ:

$$\text{Head} = A\,B \times C$$
$$\text{Trunk} = (M + N)\,L \times C$$
$$\text{Arm} = (G + H + I)\,F \times C$$
$$\text{Hand} = J\,K \times C$$
$$\text{Leg} = (P + S + V)\,(W + R) \times C$$
$$\text{Foot} = T\,U \times C$$

The value of the constants is as in Table 16.

When the formulæ were applied to the results obtained by actual measurements, the average error was ± 2.24 per cent, and the maximum error ± 5.43 per cent. The method was very complicated and the error was relatively large.

Table 15. — Linear Measurement.

Sujets Subject	Takahira	Kitagawa	Ishibashi	Kayano	Shimizu	Tanaka	Kato	Ogishima	Nakamura	Kawaguchi
A.	70.0	67.5	67.0	67.0	66.0	66.0	65.5	65.75	64.5	66.2
B.	55.0	54.0	53.5	56.0	54.0	56.5	55.0	54.5	54.5	54.7
L.	53.0	49.5	53.0	49.0	54.0	50.0	53.0	49.75	50.0	52.0
W.	42.5	39.0	38.0	36.0	38.0	36.5	38.0	37.75	32.0	37.0
R.	43.5	39.5	40.5	37.5	42.5	40.5	40.5	37.0	40.5	42.0
O.	41.25	36.0	39.0	36.5	36.5	39.0	37.0	39.0	35.0	35.7
T.	26.0	23.0	23.5	22.0	25.0	23.5	24.0	23.0	23.0	23.5
F.	56.5	52.0	50.0	49.5	53.0	54.0	51.0	49.0	50.5	51.2
J.	20.5	16.0	17.75	15.8	20.0	20.0	18.5	18.75	18.0	19.0
N.	81.0	78.5	78.25	83.0	84.5	80.0	84.5	79.75	75.5	82.0
M.	65.0	64.0	62.5	67.0	66.0	61.0	72.5	72.0	56.5	66.2
Q.	81.5	80.5	81.0	81.5	87.5	79.5	83.0	82.5	74.0	82.5
P.	43.75	46.0	47.5	50.8	52.0	46.0	48.75	47.25	36.0	45.5
S.	31.5	32.5	31.5	32.5	34.5	31.0	22.0	30.5	27.5	31.0
.	18.75	19.0	18.75	20.0	22.5	16.5	20.5	19.5	17.0	18.2
U.	22.25	24.5	20.5	23.0	24.5	22.5	22.5	22.75	21.0	22.0
G.	25.0	23.5	25.5	28.0	25.0	23.5	27.5	26.75	21.5	25.5
H.	23.5	23.5	23.5	25.0	25.5	23.0	25.5	23.75	21.0	24.5
I.	15.5	15.0	15.75	16.0	18.0	16.5	17.5	16.75	13.5	15.5
K.	19.0	18.5	19.0	17.0	21.5	20.0	20.0	19.5	18.0	19.5

Table 16. — Constants of Linear Formulæ.

Sujets Subject	Tête Head	Torse Trunk	Bras Arms	Mains Hands	Jambes Legs	Pieds Feet
Takahira	0.4039	0.5134	0.6424	2.2900	0.7457	1.9914
Kitagawa	0.4041	0.5156	0.6566	2.7331	0.7626	1.9361
Ishibashi	0.4224	0.5059	0.6755	2.4125	0.7273	2.1671
Kayano	0.3945	0.4785	0.6552	2.7215	0.7416	2.0751
Shimizu	0.4108	0.4592	0.6181	2.1465	0.7295	2.0343
Tanaka	0.3982	0.4780	0.6340	2.1550	0.7749	2.1560
Kato	0.4064	0.4904	0.6288	2.3000	0.6585	1.9852
Ogishima	0.4211	0.5352	0.6968	2.3800	0.7715	2.1042
Nakamura	0.4108	0.4818	0.6478	0.4660	0.7911	1.9938
Kawaguchi	0.4091	0.5317	0.6560	2.3593	0.7480	2.0928
Moyenne } Average }	0.4081	0.4990	0.6511	2.3964	0.7451	2.0536

Table 17. — Error of Geometrical Measurement.

Sujets Subject	Superficie réelle Surface area	Superficie calculée Calculated area	Difference	Difference %
Takahira	15923	15930	+ 7	+ 0.04
Kitagawa	14964	14676	— 288	— 1.96
Ishibashi	14913	14808	— 105	— 0.71
Kayano	14647	14763	+ 116	+ 0.79
Shimizu	16010	16699	+ 689	+ 4.13
Tanaka	14593	14664	+ 710	+ 0.48
Kato	15621	16626	+ 1005	+ 6.04
Ogishima	15425	14817	— 804	— 5.43
Nakamura	12793	12685	— 108	— 0.85
Kawaguchi	15304	15004	— 300	— 2.00
Moyenne — Average	—	—	—	± 2.24

5. Discussion of the Results.

A simple formula for estimating the body surface area would naturally be referable to a more complicated one; however, with a simple formula, we do not btain as accurate results.

The formula for calculating the body surface area from the body weight only — r instance — Meeh's formula, usually gave too high results. When the constant was anged, the result was too high in a thin person and too low in an obese person.

This type of formula is not therefore suitable for the calculation of the body surface area.

The formula for calculating the body surface area from the body height and body weight was the best one. The following three formulæ devised by Du Bois gave good results.:

$$A = H \times W^{\frac{1}{3}} \times C$$

$$A = H^{\frac{1}{2}} \times W^{\frac{1}{2}} \times C$$

$$A = H^{.725} \times W^{.425} \times C$$

If the constant was changed to 169.2 in Du Bois' linear formula, the average error was ± 1.14 per cent and the maximum error ± 2.82 per cent. If the constant was changed to 72.46 in Du Bois' height-weight formula, the average error was ± 0.95 per cent and the maximum error ± 2.64 per cent. This modified Du Bois height-weight formula gave the least error.

The more complicated formula of Stöltzner-Miwa, which employed, besides the body height and body weight, as an additional factor the circumference of the trunk was not so good. Bouchard's formula gave relatively better results.

The geometrical measurements gave rather poor results and were very complicated.

Table 18. — Summarising Table.

Auteur Author	Formule Formulæ	Erreur moyenne Average error %	Erreur maximum Maximum error %
Meeh	$A = W^{\frac{2}{3}} \times 12.3$	+ 9.26	+ 12.38
——	$A = W^{\frac{2}{3}} \times 11.15$	± 1.91	± 4.21
Lissauer	$A = \frac{W}{H} \times 48.48$	± 4.32	± 9.22
——	$A = H \times W^{\frac{1}{3}} \times 25.47$	± 1.37	± 3.53
Du Bois-Du Bois	$A = H^{\frac{1}{2}} \times W^{\frac{1}{2}} \times 167.2$	± 1.56	± 3.16
——	$A = H^{\frac{1}{2}} \times W^{\frac{1}{2}} \times 169.2$	± 1.14	± 2.82
Du Bois-Du Bois	$A = H^{.725} \times W^{.125} \times 71.84$	± 1.28	± 3.50
——	$A = H^{.725} \times W^{.425} \times 72.46$	± 0.95	± 2.64
Stöltzner-Miwa	$A = \frac{U\,H\,W}{\sqrt[6]{H^4 W^4 U^2}} \times 40.42$	± 1.78	± 3.62
Bouchard	$A = 0.386LH + 8.239\frac{W}{L} + 3.162H\sqrt{\frac{W}{\pi H}}$	± 1.12	± 2.91
	Mesure géométrique Geometrical measurement	± 2.24	± 5.43

A formula for expressing surface area must naturally be a bi-dimensional one, as surface involves two dimensions. If we assume that weight is proportional to volume, it is obvious that three dimensions are involved in any measurement expressing weight. Height is, of course, a single dimension. The three formulæ $A = H \times W^{\frac{1}{3}} \times C$, $A = H^{\frac{1}{2}} \times W^{\frac{1}{2}} \times C$, and $A = H^{.725} \times W^{.425} \times C$ are bi-dimensional and logical.

Using the general formula $A = W^{\frac{1}{a}} \times H^{\frac{1}{b}} \times C$, if $\frac{2}{a} + \frac{1}{b} = 2$ and $2 > b > 1$, according to Du Bois a good result is obtained when $a = 2.35$ and $b = 1.38$. I find that if $a = 2.34$ and $b = 1.39$ the minimum error is obtained. The formula $A = W^{.427} \times H^{.718} \times 74.49$ gives an average error of $\pm$ 0.94 per cent and a maximum error of $\pm$ 2.62 per cent.

Table 19. — Formulæ, in which $\frac{3}{a} + \frac{1}{b} = 2$ and $2 > b > 1$.

No.	Formules Formulæ		C	Erreur moyenne Average error	Erreur maxim Maximal error
1	$W^{\frac{1}{3}} \times H^{\frac{1}{1}} \times C$	$W^{.333} \times H^{1.000} \times C$	25.689	±1.336	+3.527
2	$W^{\frac{1}{2.9}} \times H^{\frac{1}{1.04}} \times C$	$W^{.345} \times H^{.966} \times C$	29.164	±1.269	+3.414
3	$W^{\frac{1}{2.8}} \times H^{\frac{1}{1.08}} \times C$	$W^{.357} \times H^{.938} \times C$	32.077	±1.207	+3.312
4	$W^{\frac{1}{2.7}} \times H^{\frac{1}{1.13}} \times C$	$W^{.370} \times H^{.889} \times C$	39.090	±1.119	+3.168
5	$W^{\frac{1}{2.6}} \times H^{\frac{1}{1.18}} \times C$	$W^{.385} \times H^{.846} \times C$	45.852	±1.073	+3.026
6	$W^{\frac{1}{2.5}} \times H^{\frac{1}{1.25}} \times C$	$W^{.400} \times H^{.800} \times C$	54.607	±1.024	+2.879
7	$W^{\frac{1}{2.4}} \times H^{\frac{1}{1.33}} \times C$	$W^{.417} \times H^{.750} \times C$	65.851	±0.976	+2.716
8	$W^{\frac{1}{2.3}} \times H^{\frac{1}{1.44}} \times C$	$W^{.435} \times H^{.696} \times C$	80.722	±0.947	+2.541
9	$W^{\frac{1}{2.2}} \times H^{\frac{1}{1.57}} \times C$	$W^{.455} \times H^{.637} \times C$	100.659	±0.997	—2.461
10	$W^{\frac{1}{2.1}} \times H^{\frac{1}{1.75}} \times C$	$W^{.476} \times H^{.571} \times C$	129.637	±1.000	—2.648
11	$W^{\frac{1}{2.0}} + H^{\frac{1}{2.0}} \times C$	$W^{.500} \times H^{.500} \times C$	169.184	±1.140	—2.824
1	$W^{\frac{1}{2.39}} \times H^{\frac{1}{1.34}} \times C$	$W^{.418} \times H^{.745} \times C$	67.279	±0.967	+2.702
2	$W^{\frac{1}{2.38}} \times H^{\frac{1}{1.35}} \times C$	$W^{.420} \times H^{.740} \times C$	68.470	±0.964	+2.685
3	$W^{\frac{1}{2.37}} \times H^{\frac{1}{1.36}} \times C$	$W^{.422} \times H^{.734} \times C$	70.036	±0.955	+2.644
4	$W^{\frac{1}{2.36}} \times H^{\frac{1}{1.37}} \times C$	$W^{.424} \times H^{.729} \times C$	71.278	±0.955	+2.648
5	$W^{\frac{1}{2.35}} \times H^{\frac{1}{1.38}} \times C$	$W^{.426} \times H^{.723} \times C$	72.909	±0.949	+2.628
6	$W^{\frac{1}{2.34}} \times H^{\frac{1}{1.39}} \times C$	$W^{.427} \times H^{.718} \times C$	74.490	±0.943	+2.615
7	$W^{\frac{1}{2.33}} \times H^{\frac{1}{1.40}} \times C$	$W^{.429} \times H^{.712} \times C$	76.192	±0.944	+2.598
8	$W^{\frac{1}{2.32}} \times H^{\frac{1}{1.41}} \times C$	$W^{.431} \times H^{.709} \times C$	77.543	±0.945	+2.578
9	$W^{\frac{1}{2.31}} \times H^{\frac{1}{1.43}} \times C$	$W^{.433} \times H^{.701} \times C$	79.318	±0.946	+2.558

In summarising the results, I would say that Du Bois' original height-weigh formula is applicable for Japanese subjects. But results showing the least erro can be obtained by the following two formulæ:

$$A = H^{.725} \times W^{.425} \times 72.46.$$
$$A = H^{.718} \times W^{.427} \times 74.49.$$

In these formulæ the average error is ± 0.94 to 0.95 per cent, and the maximu error ± 2.62 to 2.64 per cent.

Bouchard's formula $A = C_1LH + C_2\frac{W}{L} + C_3H\sqrt{\frac{W}{\pi}}$ gives better resul when for the constants C_1, C_2, C_3 the values of 0.386, 8.239 and 21.62 respectivel are applied.

6. Summary.

The body surface area of ten men was actually measured. The method measurement consisted in making a thin paper mould of the body and cuttin this mould into small pieces which would lie flat; the area of the paper was th measured by Amsler's planimeter. The shrinkage of the paper mould was allow for.

It was found that the proportion of the surface area of the head, trunk, arm hands, legs and feet averaged 10, 25, 14, 6, 38 and 7 per cent respectively of t total surface area of the body.

The applicabilities of the various formulæ for estimating body surface ar were tested. The formula for calculating body surface area from the body weig only is not reliable. The bi-dimensional formulæ using both body height and bo weight are the best. The formulæ which employ any additional factor, such the circumference of the chest or hip, are not so good. The geometrical measuremer give poor results.

Du Bois' height-weight formula gave the best results; for Japanese subjec the following two formulæ give the least error:

$$A = H^{.725} \times W^{.425} \times 72.46.$$
$$A = H^{.718} \times W^{.427} \times 74.49.$$

With these formulæ the average error is ± 0.94 to 0.95 per cent and the ma mum error ± 2.62 to 2.64 per cent.

METABOLISM DURING FASTING AND SUBSEQUENT RE-FEEDING

By Hideo Takahira.

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1. Introduction and Experimental Procedures.

Deprived of food, the organism must naturally subsist upon its own body ıbstance and derive the energy necessary for maintaining its functional activity om such stores as are already present in its tissues. Under these circumstances ıe metabolic processes are reduced to a minimum, because in prolonged inanition ıe organism tends to spare its material resources. The metabolism during fasting ıs received much attention ever since the problems of nutrition have been subjected scientific enquiry.

Ever since Professor Luciani did his famous metabolism experiment on the ofessional faster Succi, fasting men have frequently served as subjects for metabolic vestigations. The most completely studied human fast is, perhaps, that of vanzin, performed by Benedict and his collaborators of the Nutrition Laboratory the Carnegie Institute of Washington.

I studied six cases of men who fasted from 12–30 days. In five of the cases, e metabolic experiments were carried out both during fasting and during subse- ient re-feeding. The experimental subjects were as follows:

1. H. Takahira (the author): 27 years old, thin man of 50 kgs. body weight and 169 cms. body height; fasted 12 days in 1922 and 14 days in 1923.
2. K. Shigeta: a lawyer, 29 years old, thin man of 43 kgs. body weight and 155 cms. body height; fasted 16 days in 1922.
3. I. Yamana: a priest, 27 years old, moderately well nourished, of 51 kgs. body weight and 158 cms. body height; decreased his diet six days (1,174 calories in first two days, 569 calories in second two days, and 244 calories in last two days) and then fasted 17 days in 1922.
4. T. Ito: a Shinto priest, 29 years old, very obese man of 78 kgs. body weight and 156 cms. body height; fasted 26 days in 1922.
5. K. Takagoromo: a school-teacher, 35 years old, moderately well nourished, of 58 kgs. body weight and 169 cms. body height; fasted 30 days in 1922.

2. The Loss of Body Weight.

The loss of body weight, roughly speaking, expresses the total loss of body terial. The weight of every subject was measured daily at 8 a.m., the bladder ng emptied immediately before the weighing. The amount of water drunk ing each fast day was constant, namely, 800 cc. by Takahira, 700 cc. by Shigeta, cc. by Yamana, and 1,000 cc. by Ito and Takagoromo. On the first fast day, tor oil was administered and the contents of the intestines were emptied.

Table 1. — Change of Body Weight during Fasting

(Body Weight in kgs.)

Jours Days	Takahira	Takahira	Shigeta	Yamana	Ito	Takagorom
			Poids avants le jeûne. — Before fasting.			
1	50.20	50.50	43.30	50.55	77.10	58.85
			Poids pendant le jeûne. — During fasting.			
1	50.40	49.40	43.50	* 50.85	77.20	58.40
2	49.00	48.40	42.60	* 50.30	75.60	56.85
3	47.60	47.50	41.80	* 49.65	74.70	56.20
4	46.10	46.60	40.80	* 48.85	73.35	55.20
5	45.40	45.80	39.90	* 48.10	72.50	54.20
6	44.90	45.50	39.00	* 47.60	71.80	53.90
7	44.55	45.10	38.20	46.90	71.00	53.30
8	44.20	44.70	38.00	46.25	70.60	52.80
9	43.90	44.20	37.80	45.95	70.35	52.35
10	43.60	43.90	37.40	45.85	70.00	52.00
11	43.30	43.50	37.00	45.10	69.80	51.55
12	42.90	43.10	36.80	44.85	69.60	51.05
13		42.70	36.50	44.55	69.20	50.85
14		42.40	36.30	44.15	69.00	50.20
15			36.20	44.00	68.50	50.05
16			36.10	43.70	68.20	49.70
17				43.60	67.95	49.55
18				43.15	67.55	49.25
19				42.95	67.20	48.95
20				42.60	66.80	48.55
21				42.40	66.40	48.30
22				42.00	66.10	47.90
23				41.80	65.40	47.60
24					65.10	47.40
25					64.75	49.15
26					64.65	46.80
27						46.40
28						46.00
29						45.85
30						45.45
			Poids après le jeûne. — After fasting.			
1	42.60	42.20	36.00	41.35	64.40	44.9

* Diète progressive. — Decreased diet.

Table 2. — Change of Body Weight during Fasting.
(Body Weight in percentages.)

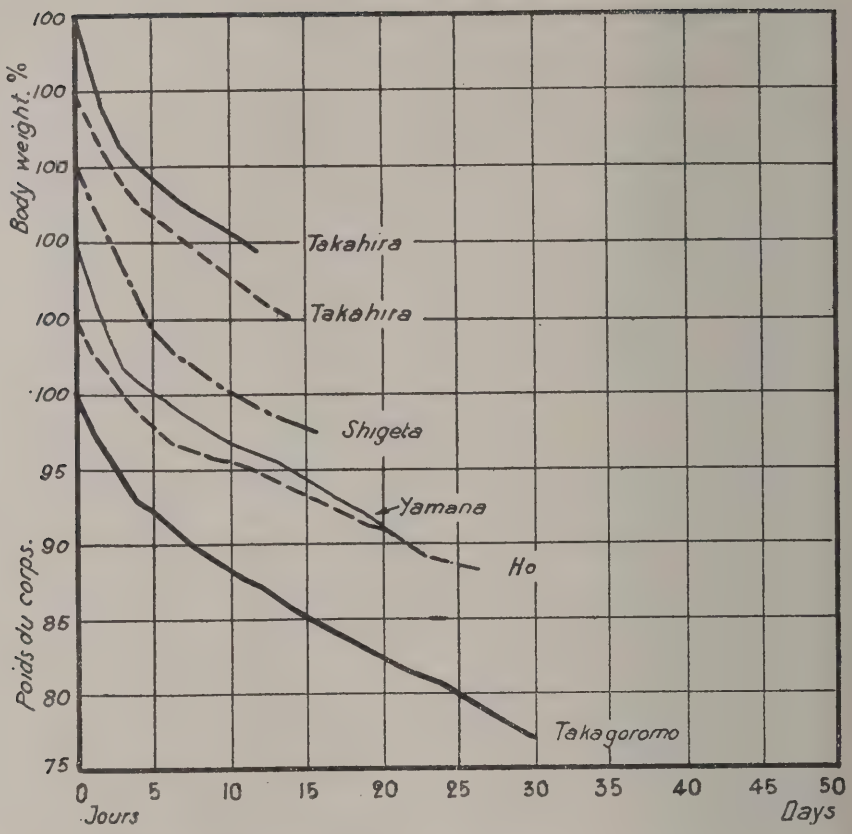
Jours Days	Takahira	Takahira	Shigeta	Yamana	Ito	Takagoromo
1	97.2	98.0	97.9	97.6	97.9	97.4
2	94.4	96.2	96.1	94.6	96.8	96.2
3	91.5	94.3	93.8	92.2	95.0	94.5
4	90.1	92.7	91.7	91.0	93.9	92.8
5	89.3	92.1	89.7	90.4	93.1	92.3
6	88.4	91.3	87.8	89.8	92.0	91.3
7	87.4	90.5	87.4	88.7	91.6	90.4
8	87.3	89.5	86.9	88.2	91.1	89.6
9	86.5	88.9	86.0	87.6	90.7	89.0
10	85.9	88.1	85.1	86.8	90.4	88.3
11	85.3	87.2	84.6	86.5	90.2	87.4
12	84.5	86.4	83.9	85.9	89.6	87.2
13		85.8	83.4	85.7	89.4	86.0
14		85.4	83.2	84.9	88.4	85.7
15			83.0	84.5	88.3	85.1
16			82.8	83.8	88.0	84.8
17				83.2	87.5	84.3
18				82.6	87.0	83.3
19				82.2	86.5	83.1
20				81.3	86.0	82.7
21					85.6	82.0
22					84.7	81.5
23					84.3	81.2
24					83.9	80.7
25					83.7	80.1
26					83.4	79.5
27						78.8
28						78.5
29						77.8
30						77.0

The daily change of body weight is represented in Table 1. Table 2 represents he change of body weight as a percentage of the original weight. Chart 1 represents he change of weight graphically.

The loss of body weight in the first few days of the fast is relatively large, but, after week's fast, the daily loss of weight becomes smaller and practically constant. he curve of body weight begins as a hyperbola but after a week it becomes a straight ne.

Since a reasonable regularity was shown in the course of the curve, a formula as devised, according to the method of Lange, to express the change in weight.

Chart 1.



Using W to represent the weight in kilograms and T the time in days, the weigh for any given day may be found by the following equations:

Takahira . . .	W = 7.8 (10)	— 0.195 T	— 0.624 T	+ 92.2
Takahira . . .	W = 4.2 (10)	— 0.194 T	— 0.743 T	+ 95.8
Shigeta . . .	W = 8.5 (10)	— 0.544 T	— 0.544 T	+ 91.5
Yamana . .	W = 7.0 (10)	— 0.215 T	— 0.584 T	+ 93.0
Ito	W = 5.0 (10)	— 0.190 T	— 0.446 T	+ 95.0
Takagoromo .	W = 6.3 (10)	— 0.146 T	— 0.557 T	+ 93.0

According to the classical researches of Chossat, the maximum loss which a organism is able to survive is about 40 per cent of its initial weight; beyond th death from exhaustion usually supervenes. This dictum can no longer be accepte as we know that the final loss of weight depends on a number of factors, *e.g.*, t store of fat in the body, the size of the body, age, etc. However, roughly speakin it is true in the case of the higher mammals.

Before 40 per cent of the initial weight was lost, the following periods woul elapse :

Takahira	50	days
Takahira	48	»
Shigeta	56	»

Yamana	57 days
Ito	79 »
Takagoromo	61 »

In thin men and moderately well nourished men, this loss takes from 50 to 60 days, but in very obese men it takes 80 days.

On the last fast day the total loss of body weight was as follows:

Sujets Subject	Jour du jeûne Day of fast	Poids au commencement Initial weight (kgs.)	Diminution du poids Loss of weight (kgs.)	Pourcentage de diminution Percentage of loss
Takahira . . .	12th	50.40	7.80	15.5
Takahira . . .	14th	49.40	7.20	14.6
Shigeta. . . .	16th	43.50	7.50	17.2
Yamana	20th	50.85	8.50	18.7
Ito	26th	77.20	12.80	16.6
Takagoromo . .	30th	58.40	13.45	23.0

Avrorov divided a fasting period into four separate periods, each covering the me taken for the body to lose 10 per cent of its weight. Using his terminology, ie fasts in our five subjects did not proceed beyond the middle of the second period, ccept in the case of Takagoromo, whose fast proceeded to the beginning of the third eriod.

After 12 fast days the loss of body weight in each subject was as follows:

Sujets Subject	Poids au commencement Initial weight (kgs.)	Diminution du poids Loss of weight (kgs.)	Pourcentage de diminution Percentage of loss	Superficie du corps au début Initial body surface (sq. m.)	Diminution de poids par unité de surface Loss in kgs. per surface unit
Shigeta . . .	43.50	7.00	16.1	1.39	5.04
Takahira . . .	50.40	7.80	15.5	1.57	4.99
Takahira . . .	49.40	6.70	13.6	1.57	4.29
Yamana . . .	50.85	7.15	14.1	1.50	4.77
Takagoromo .	58.40	7.55	12.9	1.66	4.55
Ito	77.20	8.00	11.1	1.77	4.52

It is evident that the percentage loss of body weight varies in proportion to initial weight, but the loss in square meters of body surface is practically constant each subject. The body surface law of Rubner is applicable to the loss of body ight in fasting men.

3. Basal Metabolism.

The gaseous exchange was examined with a Benedict and Tompkins clinica respiration apparatus every other day. The experiments lasted about two t three hours each morning. The heat production was determined by indirect calori metry, and the basal metabolism per square meter of body surface per hour wa calculated. For details of the gaseous exchange, heat production, pulse rate an respiration rate, see Tables to 37.

The basal metabolism before the fast was 37.66 calories in Takahira, 38.7 calories in Shigeta, 37.60 calories in Yamana, 39.17 calories in Ito, and 38.2 calories in Takagoromo. This averages 38.29 calories and agrees with the bas value of normal Japanese men.

In the course of the fast the metabolism was reduced to the physiologic minimum. In Takahira, from the 8th to the 12th fast day, the metabolism wa 31.76 to 30.45 calories. In Shigeta, from the 10th to the 16th fast day, it wa 33.85 to 30.09 calories. In Yamana, from the 10th to the 20th fast day, it wa 33.85 to 28.28 calories. In Ito, from the 10th to the 26th fast day, it was 32.5 to 28.69 calories. And in Takagoromo, from the 4th to the 30th day, it was fro 31.95 to 25.97 calories.

The metabolism reached its new low level after the loss of about 10 per cent the original weight, *i.e.*, at the beginning of the second period. However, in t course of the second period the metabolism still decreased constantly though slowl

For Takahira, Shigeta, Yamana and Ito, the fast did not proceed beyond t middle of the second period, and their basal metabolism ranged from 33 to calories, the average being 30 calories. The fast of Takagoromo proceeded to t beginning of the third period, and his basal metabolism was reduced to 26 calori

By the last fast day the basal metabolism was reduced to the extent sho in the following table:

Sujets Subject	Jour de jeûne Day of fast	Métabolisme au commencement Initial metabolism	Métabolisme à la fin Final metabolism	Diminution du métabolisme Decrease of metabolism %
Takahira . . .	12th	37.66	30.45	19
Shigeta	16th	38.74	30.09	22
Yamana	20th	37.60	28.28	25
Ito	26th	39.17	28.69	27
Takagoromo . .	30th	38.28	25.97	32

During the first few days of the fast the basal metabolism did not decre but rather increased above the normal value. In Takahira it reached 40.50 calo on the 2nd fast day, in Shigeta 39.40 calories on the 4th fast day and in Ito 41 and 40.56 calories on the 2nd and 4th fast days. This was due to an increa oxygen consumption. The carbon dioxide production decreased constantly dur the fast. This increased metabolism may be due to increased protein catabol The disintegration of body protein decreases during the first fast day, but increa from the 2nd to the 5th fast days. The temporary increase of metabolism probably due to the specific dynamic action of the catabolised proteins.

Table 3. — METABOLISM OF TAKAHIRA

Jour de l'expérience Day of experiment	Consommation de O^2 pr heure O_2 consumption per hour (l.)	Production de CO^2 par heure CO_2 production per hour (l.)	R.Q.	Calories par m^2 et par heure Calories per sq. m. per hour	Pouls Pulse rate	Respiration Respiration rate	Cal. d'orig. protéique Protein calories %	Autres cal. Non-protein calories %
Avant le jeûne — Before fasting								
1	12.09	11.22	0.93	37.66	61	17	19	81
Pendant le jeûne — During fasting								
2	13.55	9.79	0.76	40.50	87	23	18	82
4	12.22	9.46	0.77	39.12	82	23	21	79
6	10.08	7.72	0.76	31.82	81	20	24	76
8	10.07	7.76	0.77	31.76	81	21	25	75
10	10.28	7.47	0.73	31.83	74	20	25	75
12	9.64	7.24	0.75	30.45	81	20	25	75
Après le jeûne — After fasting								
2	7.43	7.84	1.05	24.11	65	18	55	45
4	8.54	9.12	1.06	26.63	66	17	49	51
8	12.04	13.13	1.09	37.69	65	20	38	62
10	13.42	13.48	1.00	41.30	66	20	35	65

Table 4. — METABOLISM OF SHIGETA.

Jour de l'expérience Day of experiment	Consommation de O^2 pr heure O_2 consumption per hour (l.)	Production de CO^2 par heure CO_2 production per hour (l.)	R.Q.	Calories par m^2 et par heure Calories per sq. m. per hour	Pouls Pulse rate	Respiration Respiration rate	Cal. d'orig. protéique Protein calories %	Autres cal. Non-protein calories %
Avant le jeûne — Before fasting								
1	11.03	10.12	0.91	38.74	57	15	17	83
Pendant le jeûne — During fasting								
1	10.99	10.20	0.94	38.18	57	15	14	86
2	10.96	8.51	0.74	36.35	57	14	28	72
4	11.41	8.51	0.75	39.14	86	17	29	71
6	10.81	8.81	0.80	38.31	88	20	27	73
8	10.95	7.83	0.71	35.95	81	16	37	63
10	9.72	7.28	0.74	33.85	78	16	34	66
12	9.46	7.33	0.76	33.74	86	19	33	67
14	8.81	7.10	0.80	32.03	84	18	31	69
16	8.26	7.16	0.87	30.09	61	15	50	50
Après le jeûne — After fasting								
2	8.57	8.47	0.98	32.22	89	14	42	58
4	9.52	9.54	1.00	37.44	54	14	19	81
6	8.72	8.64	0.99	32.97	51	14	19	81
8	10.06	9.90	0.98	35.67	59	14	34	66

Table 5. — METABOLISM OF YAMANA.

Jour de l'expérience Day of experiment	Consommation de O^2 pr heure O_2 consumption per hour (l.)	Production de CO^2 par heure CO_2 production per hour (l.)	R.Q.	Calories par m^2 et par heure Calories per sq. m. per hour	Pouls Pulse rate	Respiration Respiration rate	Cal. d'orig. protéique Protein calories %	Autres cal. Non-protein calories %
Avant le jeûne — Before fasting								
1	11.51	10.88	0.95	37.60	67	20	14	86
Nourriture diminuée — Decreased Diet								
2	10.60	8.46	0.89	35.15	60	18	12	88
4	11.85	8.61	0.73	37.71	62	20	14	86
Pendant le jeûne — During fasting								
1	10.66	8.15	0.77	33.76	62	22	22	78
3	11.76	8.72	0.74	38.36	62	22	22	78
5	10.97	8.25	0.75	35.98	58	19	21	79
7	10.28	7.58	0.74	33.85	—	18	19	81
9	10.40	7.22	0.69	32.73	—	19	20	80
11	10.01	7.29	0.73	33.26	64	20	18	82
13	9.39	7.17	0.76	31.54	64	17	19	81
15	9.53	7.20	0.76	32.16	—	19	20	80
17	8.25	6.71	0.81	28.28	—	16	23	77
Après le jeûne — After fasting								
2	7.58	7.01	0.92	27.35	68	18	15	85
4	6.36	6.19	0.97	22.67	56	15	22	78
6	7.27	7.93	1.09	25.96	59	18	18	82
8	8.09	9.06	1.12	28.51	57	16	21	79

Table 6. — METABOLISM OF ITO.

Jour de l'expérience Day of experiment	Consommation de O^2 pr heure O_2 consumption per hour (l.)	Production de CO^2 par heure CO_2 production per hour (l.)	R.Q.	Calories par m^2 et par heure Calories per sq. m. per hour	Pouls Pulse rate	Respiration Respiration rate	Cal. d'orig. protéique Protein calories %	Autres cal. Non-protein calories %
Avant le jeûne — Before fasting								
1	14.34	12.34	0.86	39.17	68	16	14	86
Pendant le jeûne — During fasting								
2	16.26	11.35	0.70	41.11	68	18	14	86
4	15.19	11.03	0.73	40.56	80	20	17	83
6	13.43	9.57	0.71	35.79	74	18	17	83
8	13.53	9.34	0.69	35.14	—	—	17	83
10	12.00	8.81	0.73	32.53	84	18	19	81
12	12.13	9.48	0.78	33.49	80	16	19	81
14	11.96	8.71	0.73	32.75	76	17	20	80
16	12.16	8.83	0.72	33.63	—	18	17	83
18	12.33	9.04	0.73	34.76	78	18	16	84
20	10.95	8.65	0.79	30.97	76	18	16	84
22	11.26	8.95	0.79	32.23	78	18	16	84
24	10.27	8.37	0.81	29.53	66	16	18	82
26	10.24	8.24	0.80	28.69	78	18	18	82
Après le jeûne — After fasting								
2	8.65	7.86	0.91	25.94	60	16	12	88
5	8.93	9.36	1.04	26.12	52	18	17	83
6	10.09	9.96	0.98	28.07	57	16	15	85
8	13.75	13.14	0.96	38.86	70	16	14	86

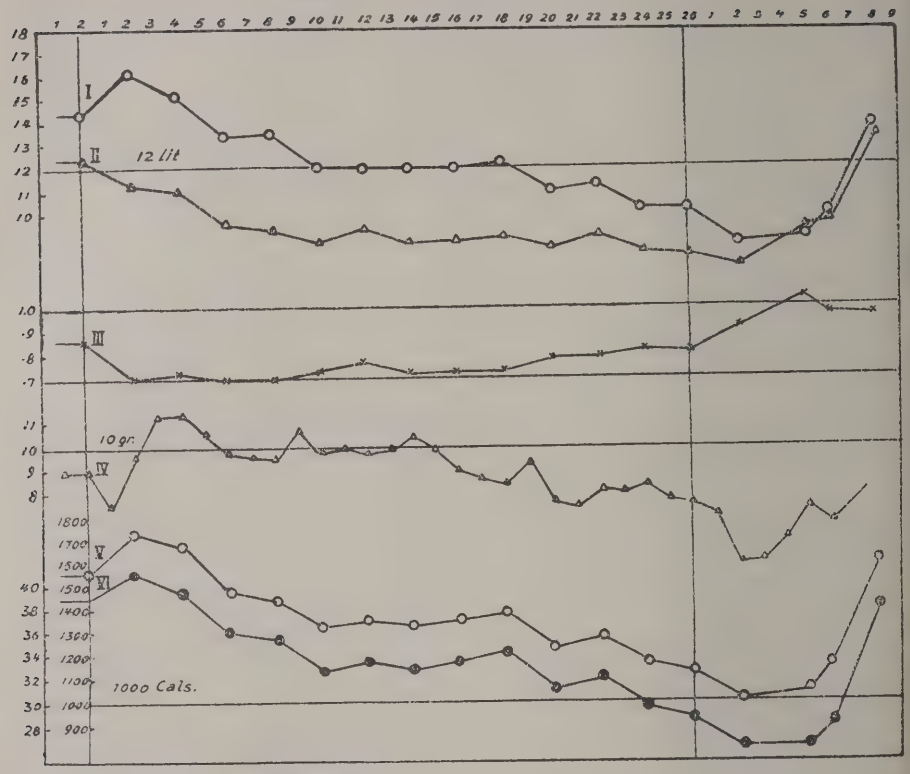
Table 7. — METABOLISM OF TAKAGOROMO.

Jour de l'expérience Day of experiment	Consommation de O^2 pr heure O_2 consumption per hour (l.)	Production de CO^2 par heure CO_2 production per hour (l.)	R.Q.	Calories par m^2 et par heure Calories per sq. m. per hour	Pouls Pulse rate	Respiration Respiration rate	Cal. d'orig. protéique Protein calories %	Autres cal. Non-protein calories %
Avant le jeûne — Before fasting								
1	13.40	10.85	0.81	38.28	60	15	15	85
Pendant le jeûne — During fasting								
2	13.60	10.55	0.78	38.63	58	14	17	83
4	11.12	8.69	0.78	31.95	58	16	22	78
6	10.58	7.98	0.75	30.62	—	14	24	76
8	11.02	8.12	0.74	32.09	—	17	20	80
10	9.68	7.75	0.80	28.61	64	16	20	80
12	9.65	7.68	0.79	28.96	73	17	19	81
14	9.57	7.40	0.77	28.98	60	16	15	85
16	8.91	7.38	0.82	27.35	64	14	18	82
18	9.05	7.50	0.82	27.94	64	14	18	82
20	8.62	7.29	0.85	27.40	62	15	19	81
22	8.64	7.53	0.87	27.05	60	15	20	80
24	8.01	7.46	0.93	25.42	63	15	20	80
26	8.24	7.44	0.90	26.15	—	15	23	77
28	8.02	7.20	0.90	25.66	64	16	25	75
30	8.09	7.24	0.89	25.97	68	16	23	77
Après le jeûne — After fasting								
2	6.87	7.38	1.07	23.07	70	16	15	85
4	7.18	7.33	1.02	24.12	63	16	15	85
7	8.07	7.96	0.99	26.02	54	15	16	84
9	8.97	9.48	1.06	28.31	56	15	16	84
11	9.97	9.82	1.00	30.72	50	12	22	78
13	10.08	10.56	1.04	29.67	50	15	20	80
19	12.11	12.22	1.09	38.23	64	16	21	79
21	14.09	13.92	0.06	43.35	68	14	18	82

Table 8. — Basal Metabolism.

Jours Days	Takahira	Shigeta	Yamana	Ito	Takagoromo
			Avant le jeûne — Before fasting		
1	37.66	38.74	37.60	39.19	38.28
			Pendant le jeûne — During fasting		
2	40.50	36.35	37.71	41.11	38.63
4	39.12	39.14	33.76	40.56	31.95
6	31.82	38.31	38.36	35.79	30.62
8	31.76	35.95	35.98	35.14	32.09
10	31.83	33.85	33.85	32.53	28.61
12	30.45	33.74	32.73	33.49	28.96
14		32.03	33.26	32.75	28.98
16		30.09	31.54	33.63	27.35
18			32.16	34.76	27.94
20			28.28	30.97	27.40
22				32.23	27.05
24				29.53	25.42
26				28.69	26.15
28					25.66
30					25.97
			Après le jeûne — After fasting		
2	24.11	32.22	27.35	25.94	23.07
4	26.63	37.44	22.67	26.12	24.12
6		32.97	25.96	28.07	26.02
8	37.69	35.67	28.51	38.86	28.31
10					30.72
11	41.30				
13					29.67
19					38.23
21					43.35

Chart 2. — Metabolism of Ito.



I. O_2 consumption.
II. CO_2 production.
III. R.Q.
IV. N excretion.
V. Total calories.
VI. Number of calories per sq. m.

In the first few days of re-feeding after the fast, the basal metabolism is very low, even lower than on the last fast day. This may be due to decreased protein catabolism and to the occurrence of œdema in the tissues. Later the metabolism again increases to its normal value and finally exceeds it. In Takahira it had risen to 41.30 calories by the 11th day after the fast; in Takagoromo it had reached 43.35 calories by the 21st day after the fast.

4. Nature of the Substances catabolised in the Body.

The nature of the substances catabolised in the body can be judged by the respiratory quotient and the nitrogen excretion in the urine. However, the gross respiratory quotient must be regarded as the resultant of many factors, so that, from a purely mathematical consideration of the respiratory quotient, one may fail to grasp its biological significance.

The respiratory quotient becomes lower in the fasting period, being below (8). It is usually lowest after the first week's fast, when it becomes nearly 0.7. This suggests that the chief combustible material of the body is fat. During the fasting period, when a large amount of acetone bodies are being excreted in the urine, the respiratory quotient decreases. After this period it again increases slightly.

During the time of re-feeding, the respiratory quotient rose and often reached .0. This was a very curious phenomenon; if it were not due to the excessive ›umping out of carbon dioxide from the blood, it may signify that carbohydrate vas being chiefly burned or that fat was being formed from carbohydrate.

The excretion of nitrogen in the urine decreased during the first fasting day. 'his was due to the sparing action of glycogen, which was being burned in the body.)uring the second day the nitrogen excretion increased again and the maximum xcretion was reached on the 3rd or 4th fasting day. After this time the nitrogen xcretion decreased slowly and remained fairly constant; in Ito, the nitrogen excre- ion decreased steadily till the end of the fast.

Table 9. — Nitrogen Excretion Before, During and After Fasting.

Jours Days	Takahira	Shigeta	Yamana	Ito	Takagoromo
			Avant le jeûne — Before fasting		
1	10.116	7.897		8.926	9.226
2	10.286	7.967	7.157	8.813	9.036
			Pendant le jeûne — During fasting		
1	8.302	7.145	* 7.322	7.594	8.741
2	10.399	8.153	* 6.506	9.646	9.922
3	12.057	12.027	* 5.976	11.289	12.275
4	11.470	12.587	* 6.453	11.346	10.598
5	10.796	11.735	* 7.513	10.796	10.399
6	11.289	11.308	* 8.419	9.918	10.683
7	11.879	10.290	10.872	9.548	9.719
8	10.889	10.535	10.610	9.493	9.521
9	10.683	10.762	11.114	10.896	8.954
10	11.177	10.726	10.960	9.889	8.331
11	10.904	11.761	10.003	10.172	8.259
12	10.739	11.096	8.756	9.833	8.076
13		10.712	8.302	9.918	7.396
14		11.416	8.869	10.456	6.376
15		10.663	8.557	9.926	6.886
16		10.336	8.413	8.868	7.226
17			7.981	8.699	7.159
18			8.227	8.444	7.141
19			8.037	9.379	7.197
20			8.812	7.679	7.367
21			8.302	7.339	6.509
22			8.596	8.144	7.396
23			7.952	8.019	8.076
24				8.274	7.991
25				7.736	8.586
26				7.537	8.216
27					8.926
28					8.677
29					8.436
30					7.977

* Diète progressive. — Decreased diet.

Table 9. — Nitrogen Excretion Before, During and After Fasting *(cont.)*

Jours Days	Takahira	Shigeta	Yamana	Ito	Takagoromo
			Après le jeûne — After fasting		
1	15.018	9.704	6.489	7.056	6.489
2	18.090	9.479	5.242	4.817	4.959
3	25.270	6.594	5.806	5.086	4.619
4	18.648	5.876	6.469	6.319	4.874
5	21.847	6.364	7.024	7.248	6.829
6	17.098	7.877	6.271	6.631	6.206
7	19.949	9.375	7.962		6.036
8	20.689	15.205			5.044
9	19.228				6.602
10	19.268				7.789

The amount of nitrogen excreted per kilogram during the fast differed consid ably in each subject. It was greater in the thin men and smaller in Ito.

	Excretion of N. (average per day per kilo)
Takahira	0.2402 gram
Shigeta	0.2780 »
Yamana	0.2046 »
Ito	0.1334 »
Takagoromo	0.1674 »

During the subsequent re-feeding the nitrogen excretion decreased and reacl a minimum value after a few days. This minimum nitrogen excretion per kilogr of body weight was as follows:

Shigeta	0.1623 gram
Yamana	0.1257 »
Ito	0.0740 »
Takagoromo	0.1024 »

This minimum value did not occur if foods rich in protein were taken as t were by Takahira.

By mathematical computation, the nature of the catabolism during the was determined with the following results:

	Protein calories %	Non-protein calories %
Takahira	23	77
Shigeta	33	67
Yamana	19	81
Ito	17	83
Takagoromo	20	80

The percentage of protein catabolism varied from 17 to 33; it was greate the thin men and less in Ito. The non-protein portion of the catabolism ch concerned fats. However, the non-protein respiratory quotient did not desig pure fat combustion; it is possible that carbohydrate combustion was going on as

It is a well-known fact that, during fasting, the blood sugar does not disappear; or does the liver glycogen wholly disappear. Even though glycogen is burned during the first few days of fasting, it may be again resynthesised from fat or protein. There are two possible modes of derivation of carbohydrate from fat; it may be built up either from glycerine or from fatty acid radicals. Ringer and Lusk demonstrated beyond any doubt the possibility of the formation of sugar from such amino-acids as glycocoll and alanin and also from glutamic and aspartic acids. The need for carbohydrates is so great that the organism unable to obtain them with its food uses every available method to satisfy this nereod.

5. Subsequent Re-feeding.

Soon after the fasting and during the subsequent re-feeding the basal metabolism was still low, but after a few days it greatly increased. The metabolism in Takahira had reached 41.30 calories by the 10th day of re-feeding, and in Takagoromo 43.35 calories by the 21st day of re-feeding. The body temperature during the period of re-feeding was slightly higher than before fasting.

The nitrogen balance during the re-feeding period gave remarkable figures. In Takagoromo, during the 5th to the 10th days of the re-feeding period, a daily intake of 10 to 14 grams of nitrogen gave an average retention of 4.75 grams. With abundant nitrogen feeding, Takahira, during the 12 days of the re-feeding period, retained an average of 6.11 grams of nitrogen daily.

Table 10. — Nitrogen Balance of Takagoromo.

Jour de l'expérience Day of experiment	N. absorbé N. intake	N. éliminé N. output		Gain ou perte Balance	Nombre de calories dans la nourriture Calories in food
		dans l'urine In urine	dans les selles In fæces		
Avant le jeûne — Before fasting					
1	12.350	9.226	3.111	+ 0.013	2348
2	12.350	9.036	3.433	— 0.119	2348
Après le jeûne — After fasting					
1	0.016	6.489	0.512	— 6.985	413
2	2.577	4.959	0.512	— 2.895	876
3	3.681	4.619	0.468	— 1.406	919
4	4.237	4.874	1.001	— 1.638	777
5	10.068	6.829	2.018	+ 1.221	1886
6	10.003	6.206	1.630	+ 2.167	1804
7	11.932	6.036	1.254	+ 4.642	2250
8	14.910	5.044	3.107	+ 6.759	2643
9	14.277	6.602	3.608	+ 4.067	2871
10	14.321	7.789	2.997	+ 3.535	2933

Table 11. — Nitrogen Balance of Takahira.

Jour de l'expérience Day of experiment	N. absorbé N. intake	N. éliminé N. output		Gain ou perte Balance	Nombre de calories dans la nourriture Calories in food
		dans l'urine In urine	dans les selles In fæces		
Avant le jeûne — Before fasting					
1	12.204	10.116	2.755	— 0.668	2327
2	12.204	10.286	2.613	— 0.696	2327
Après le jeûne — After fasting					
1	13.778	15.018	2.135	— 3.375	2080
2	22.162	18.090	1.298	+ 2.774	2378
3	36.408	25.270	2.712	+ 8.526	2950
4	26.745	18.648	1.521	+ 6.686	2171
5	33.004	21.847	2.735	+ 8.422	2518
6	26.977	17.098	2.601	+ 7.278	2610
7	30.520	19.949	2.366	+ 8.205	4165
8	31.513	20.689	2.104	+ 8.720	4605
9	32.786	19.228	2.769	+10.789	3620
10	30.911	19.268	3.589	+ 8.066	3652
11	29.521	21.139	3.269	+ 5.113	3162
12	28.454	22.020	3.269	+ 3.165	2832

The body weight of the subjects increased steadily and in 60 to 100 day i reached a maximum. After this time the weight tended to decrease again. I the very obese man Ito, the body weight did not exceed its normal value dur the re-feeding period.

Child and Morgulis discovered that in salamanders and in white rats a rej ve nescence occurs in the tissues during recovery from fasting. The energy excha ge nitrogen balance and body weight changes in our men agree with his findings

Table 12. — Change of Body Weight after Fasting.

(Body Weight in kgs.)

kahira		Takahira		Shigeta		Yamana		Ito		Takagoromo	
Poids Weight		Jours Days	Poids Weight	Jours Days	Poids Weight	Jours Days	Poids Weight	Jours Days	Poids Weight	Jours Days	Poids Weight
				Avant le jeûne. — Before fasting.							
50.50				1	43.60			1	77.70	1	58.70
50.20		1	50.50	2	43.30	1	50.55	2	77.10	2	58.85
				Après le jeûne. — After fasting.							
42.60		1	42.20	1	36.00	1	41.35	1	64.40	1	44.95
42.90		2	43.90	2	35.50	2	40.90	2	65.10	2	44.95
45.90		3	45.80	3	35.40	3	41.10	3	67.50	3	45.10
48.40		4	47.00	4	36.20	4	41.90	4	69.40	4	44.85
49.20		5	48.40	5	37.10	5	42.10	5	70.25	5	45.45
49.70		6	48.60	6	37.70	6	43.60	6	70.65	6	46.40
49.70		7	50.00	7	38.90	7	44.60	7	70.60	7	47.55
49.90		8	50.00	8	40.30	8	45.00	17	73.10	8	48.80
51.00		9	49.40	32	45.00	9	46.30	47	75.95	9	50.50
50.40		11	51.20	45	46.30	10	47.30	54	75.75	10	51.45
51.00		12	50.80	74	46.50	25	50.50	91	76.00	11	52.00
50.90		13	50.40	139	48.00	49	55.60	103	76.50	12	53.30
52.20		14	50.20	530	49.30	70	56.60	355	81.37	13	53.90
54.10		20	52.60			107	57.70			14	53.90
55.50		25	53.80			114	57.00			15	54.15
56.00		31	54.30							16	53.95
56.00		36	54.20							17	51.70
55.10		47	55.50							18	52.50
55.00		50	54.20							19	52.30
54.00		55	54.50							20	52.75
54.00		61	54.10							21	53.60
52.20		65	54.60							22	54.30
		102	53.20							23	53.60
										35	58.40
										43	60.60
										51	61.50
										69	62.00
										85	62.20
										385	62.00

Table 13. — Change of Body Weight after Fasting.

(Body Weight in percentages.)

Takahira		Takahira		Shigeta		Yamana		Ito		Takagoror	
Jours Days	Poids Weight	Jours Days	Poids Weight	Jours Days	Poids Weight	Jours Days	Poids Weight	Jours Days	Poids Weight	Jours Days	Po Wei
Avant le jeûne. — Before fasting.											
1	100.2			1	100.2			1	100.6	1	1
2	99.6	1	102.2	2	99.5	1	99.4	2	99.9	2	1
Après le jeûne. — After fasting.											
1	84.5	1	85.4	1	82.8	1	81.3	1	83.4	1	
2	85.1	2	88.9	2	81.6	2	80.4	2	84.3	2	
3	91.1	3	92.7	3	81.4	3	80.8	3	87.4	3	
4	96.0	4	95.1	4	83.2	4	82.4	4	89.9	4	
5	97.6	5	98.0	5	85.3	5	82.8	5	91.0	5	
6	98.6	6	98.4	6	86.7	6	85.7	6	91.5	6	
7	98.2	7	101.2	7	89.4	7	87.7	7	91.5	7	
8	99.0	8	101.2	8	92.6	8	88.5	17	94.7	8	
9	101.1	9	100.0	32	103.4	9	91.1	47	98.4	9	
10	100.0	10	103.6	45	106.4	10	93.0	54	98.1	10	
11	101.1	12	102.8	74	106.9	25	99.3	91	98.3	11	
12	101.0	13	102.0	139	110.3	49	109.3	103	99.1	12	
22	103.6	14	101.6	530	113.3	70	111.1	355	105.3	13	
32	107.3	20	106.5			107	113.5			14	
42	110.1	25	109.9			114	112.9			15	
52	111.1	31	109.2							16	
60	111.1	36	109.7							17	
75	109.3	47	102.3							18	
87	109.1	50	109.5							19	
120	107.1	55	110.3							20	
150	107.1	61	109.5							21	
181	103.6	65	110.5							22	
		102	107.5							23	
										35	
										43	
										51	
										69	
										85	
										385	

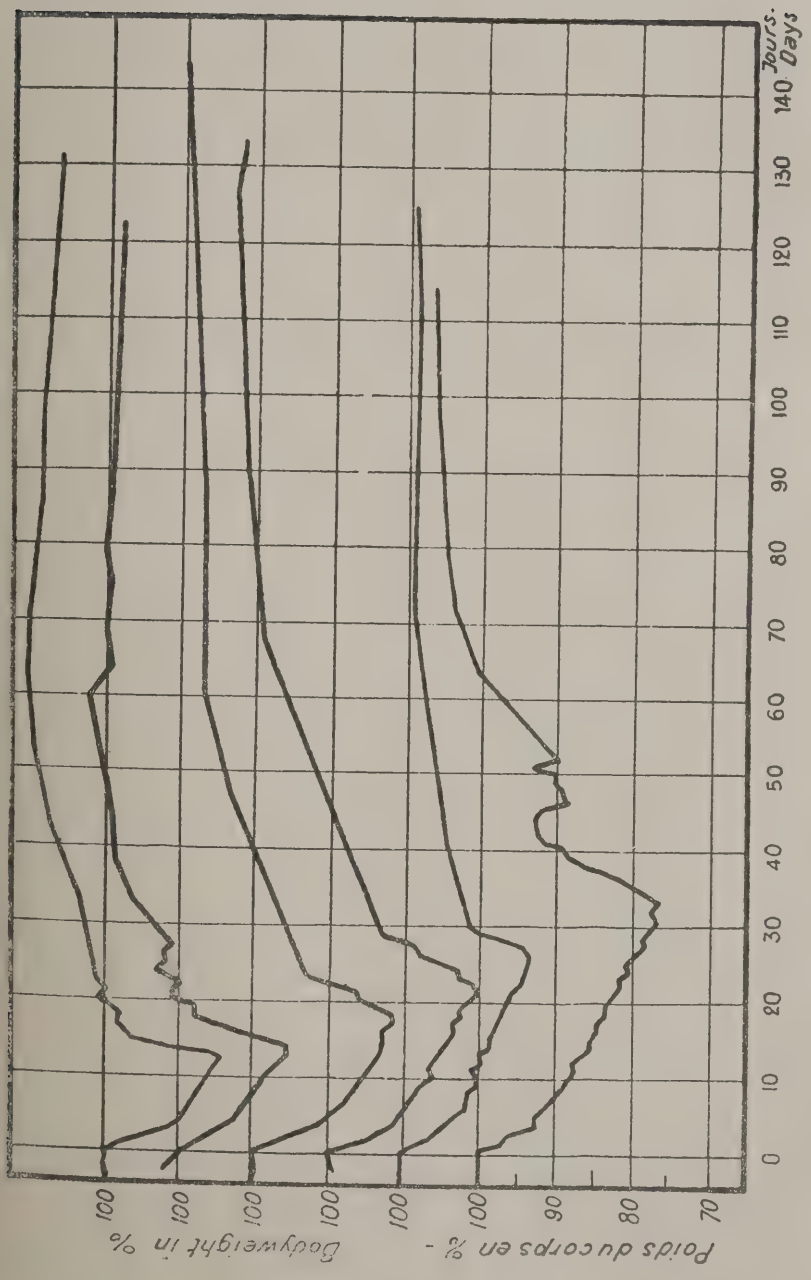


Chart 3. — Change of Body-weight after Fasting.

6. Summary.

Six men fasted for 12 to 30 days. Their loss of body weight was shown by mea of a curve.

The decrease in the basal metabolism to the physiological minimum during t fasting period and the nature of the substances catabolised in the body have be discussed.

During the subsequent re-feeding after fasting there was a tendency to reta a large amount of nitrogen. The basal metabolism increased above the norm value. The body weight exceeded the normal 80 to 100 days after the beginning the re-feeding period.

6.

MPROVEMENT OF THE PHYSICAL CONDITION OF MALNOURISHED CHILDREN.

By T. Kawakami and C. Takanabe

(From the Imperial State Institute for Nutrition, Tokyo).

Under the direction of Dr. Tadasu Saiki, we investigated the improvement the physical condition of weak children brought about by diet.

503 malnourished children (285 males and 218 females) of 8 to 15 years old were pt in hospital and observed for three weeks. Special attention was paid to their et during the period of observation. The following points were observed: (1) the rela- nship between increase or decrease of the body weight and the amount of food nsumed; (2) the relationship between the ages of the children and the amount of od consumed; (3) the relationship between constancy of body weight and the nount of food consumed.

The results are shown in the following tables:

Table I. — Relationship between Increase or Decrease of Body Weight and the Amount of Food Taken.

		Nombre d'enfants / Number of children	Quantité moyenne d'aliments par enfant et par jour / Average amount of food taken by a child per day		Quantité moyenne d'aliments par kilogr. et par jour / Average amount of food taken per 1 kg. body weight per day	
			Protéine / Protein	Calories	Protéine / Protein	Calories
(a) *Garçons — Boys.*						
Nombre total des enfants du sexe masculin observés / Total number of male children under examination	285					
Ont perdu du poids / Decrease in body-weight		18	67.4	1834	2.91	77.4
Sont restés stationnaires / Steadiness of body-weight		11	65.9	1827	2.83	78.2
Ont augmenté de poids / Increase in body-weight	De 0 à 500 gr. / 0 to 500 gms.	100	70.2	1941	3.02	83.0
	De 500 à 1000 gr. / 500 to 1000 gms.	91	69.9	1910	3.20	84.8
	De 1000 à 1500 gr. / 1000 to 1500 gms.	41	69.3	1966	3.01	85.8
	De plus de 1500 gr / Over 1500 gms.	24	71.3	2069	3.01	86.8
(b) *Filles — Girls.*						
Nombre total des enfants du sexe féminin observés / Total number of female children under examination	218					
Ont perdu du poids / Decrease in body-weight		6	65.0	1745	2.51	65.5
Sont restés-stationnaires / Steadiness of body-weight		12	64.2	1684	2.72	69.3
Ont augmenté de poids / Increase in body-weight	De 0 à 500 gr. / 0 to 500 gms.	57	62.8	1656	2.81	76.0
	De 500 à 1000 gr. / 500 to 1000 gms.	86	64.9	1736	2.91	77.6
	De 1000 à 1500 gr. / 1000 to 1500 gms.	44	64.8	1794	2.98	81.5
	De plus de 1500 gr. / Over 1500 gms.	13	68.8	1906	3.24	88.9

Table II. — Relationship between the Ages and the Amount of Food taken.

Age	Nombre d'enfants Number of children	Poids moyen Average body weight	Taille moyenne Average height	Quantité moyenne de nourriture absorbée par enfant et par jour Average amount of food taken by a child per day		Quantité de nourriture absorbée par kilog et par jour Amount of food taken per 1 kg. body. weight per day	
				Protéine gr. Protein gms.	Calories	Protéine gr. Protein gms.	Calories
Ans Years				(a) *Garçons — Boys*			
8	10	19.720	115.7	66.2	1818	3.36	92.3
9	39	20.200	117.3	65.9	1778	3.25	88.3
10	85	21.430	121.8	64.7	1810	3.06	83.4
11	66	23.830	123.7	70.0	1943	2.97	81.1
12	55	25.050	131.2	74.2	1959	2.96	78.2
13	15	27.830	134.8	74.8	2129	2.69	76.4
14	7	29.250	136.4	76.8	2166	2.63	37.9
				(b) *Filles — Girls*			
8	88	18.520	115.2	62.9	1641	3.40	88.5
9	32	20.240	120.6	64.2	1679	3.09	85.2
10	64	27.000	121.9	64.3	1673	3.08	81.5
11	75	23.230	124.5	64.3	1737	2.73	75.8
12	46	52.300	130.7	66.8	1812	2.64	71.6
13	9	25.460	130.2	68.7	1917	2.75	73.9
14	3	30.290	141.1	64.1	1805	2.13	59.2

As shown in the above table, the total amount of food taken by children reases with age; on the other hand, the amount of food taken per kilogram body weight decreases with age.

le III. — Relationship between the Steadiness of Body-weight and the Amount of Food taken.

Poids Body-weight	Nombre d'enfants Number of children	Quantité moyenne de nourriture absorbée par enfant et par jour Average amount of food taken by a child per day		Quantité de nourriture absorbée par kilogramme de poids. Amount of food taken per 1 kg. body-weight	
		Protéine (gr.) Protein (gms.)	Calories	Protéine (gr.) Protein (gms.)	Calories
		(a) *Garçons — Boys.*			
viron – Around 20 kg.	23	66.7	1854	3.26	90.3
25 »	14	72.6	1968	2.85	77.4
30–31 »	6	73.5	2108	2.39	68.7
		(b) *Filles — Girls.*			
iron – Around 20 kg.	29	63.7	1703	3.20	83.5
25 »	13	68.3	1838	2.69	72.5
0–31 »	5	70.7	1969	2.28	64.6

The total amount of food taken runs parallel to the body weight but the amou of food taken per kilogram body weight per day decreases with the increase body weight.

As shown by the results obtained, we were able to improve the malnourish children by proper diet within 3 weeks. We wish therefore to propose a stand diet for malnourished and weak Japanese children, which is as follows:

Age	Poids Body-weight (Kilog.)	Quantité de nourriture par jour Amount of food per day		Quantité de nourriture par kilog. de poids Amount of food per 1 kilog. of body-weigh	
		Protéine (gr.) Protein (gms.)	Calories	Protéine (gr.) Protein (gms.)	Calories
(a) *Garçons — Boys.*					
8 ans — years	19.500	65.0	1800	3.4	92.8
9 »	20.500	65.0	1830	3.1	89.3
10 »	22.000	65.0	1880	2.09	85.5
11 »	23.500	70.0	1940	2.7	82.6
12 »	25.500	70.0	1980	2.6	78.0
13 »	28.500	75.0	2120	2.5	75.7
14 »	30.000	75.0	2200	2.3	73.3
(b) *Filles — Girls.*					
8 ans — years	18.500	63.0	1650	3.4	89.2
9 »	20.000	65.0	1700	3.1	87.0
10 »	21.000	65.0	1750	3.0	82.9
11 »	23.500	65.0	1800	2.7	78.3
12 »	25.500	70.0	1850	2.6	74.5
13 »	27.000	70.0	1900	2.5	72.3
14 »	30.000	70.0	2100	2.3	70.1

7.

STUDIES ON THE DIGESTIBILITY AND UTILISATION OF RICE OF DIFFERENT GRADES OF POLISHING.

By Koichi Sugimoto

(From the Imperial State Institute for Nutrition, Tokyo).

FIRST REPORT.

A general summary of this paper was reported at the third and fourth meetings the Imperial Government Institute for Nutrition, at the second meeting of the hysiological Association of Japan, and at the combined meeting of the Japanese gricultural and the Japanese Agricultural Chemical Association, held in April 1925.

Introduction.

Rice is the staple food of the Japanese, so that the investigation of problems nnected with its use is most important and necessary, not only from the scientific andpoint but also from that of Japanese national economy and food policy.

Rice was used in Japan for centuries in its crude form. About two hundred years go, in Tokugawa's era, the Japanese began to eat polished rice and since then its se has gradually became universal in the country.

Numerous studies and investigations concerning the effect of polishing rice ave recently been carried out, especially since the discovery of vitamins and of eir relation to beri-beri. The problem is not yet settled and many different points main to be investigated.

When the Imperial State Institute for Nutrition was founded under the direction T. Saiki, I started experiments on the digestibility and utilisation of rice of diffe- nt grades of polishing to ascertain what grade of polishing we should recommend r our national food.

There are numerous papers dealing with the digestibility of foods containing ce as the staple constituent, yet most of the work reported has been concerned with olished rice. We have found very few papers dealing with the comparative gestibility of rice of different grades of polishing. Experiments undertaken to mpare the digestibility of unpolished and half-polished rice have already been rried out, but under such unsatisfactory and varying conditions that the results otained are not comparable.

Methods of Procedure.

The experiments were carried out on men living under conditions of ordinar daily life. During the experiments they resided at the Institute and engaged their regular routine work. They were examined medically every day and caref attention was paid to their health. They were weighed each morning just befo breakfast.

Each experiment lasted for 13 days; the first three days I shall call the "pr paratory period", the last two days the "latter period", and the eight days between the "principal experimental period". This last period was divided in four periods of two days each, called respectively the "polished rice period", t "half-polished rice period", the "70%-polished rice period", and the "unpolish rice period"; during each period the subjects were given rice of the polishing gra corresponding to the respective periods. In the preparatory and latter perio they took the same polished rice as in the polished rice period. During the expe ment their temperatures were taken every day.

The rice used for the experiment was third-grade "Shonai", which is commor used by the Japanese. This rice was polished at the Institute without the u of "polishing powder". The percentage lost by polishing was 7.26 per cent polished rice, 5.47 per cent in 70%-polished rice, and 4.19 per cent in half-polish rice.

The rice was cooked before each meal. One "sho" (1.82 litre) of rice w repeatedly washed until the wash water was almost clear (as is commonly practis in Japanese households) and was then cooked. The volume of water used for cooki the rice depended upon the grade of polishing of the rice; the amount of wa was 2,000 cc. for polished rice, 2,300 cc. for 70%-polished rice and half-polish rice, and 3,000 cc. for unpolished rice. Analysis of the boiled rice of the differe grades of polishing gave the following results:

	Total N. %	Crude protein %	Carbo-hydrate as glucose %	Crude fat %	Crude ash %	Wate %
Polished rice . . .	0.3868	2.41	30.29	0.25	0.12	66.07
70%-polished rice .	0.4697	2.94	30.37	0.45	0.18	63.63
Half-polished rice. .	0.4940	3.09	27.97	0.50	0.23	62.71
Unpolished rice . .	0.5320	3.31	30.97	1.12	0.48	58.95

The side dishes eaten by each subject were kept constant throughout experiment, while the boiled rice and drinking-water were taken *ad libitum*. side dishes were cooked in the same way at each meal time, each item being accurat weighed or measured.

The constituents of the daily side dishes were as follows:

Aliments Materials	Quantité (gr.) Quantity (gms.)	Azote total (gr.) Total N. (gms.)	Protéine brute (gr.) Crude protein (gms.)	Hydrocarbures glycose (gr.) Carbohydrate as glucose (gms.)	Graisse brute (gr.) Crude fat (gms.)	Cendres brutes (gr.) Crude ash (gms.)	Calories
Miso	38	0.4451		3.18	1.77	3.19	
Satoimo	100	0.3110		13.44	0.18	0.93	
Poisson sec en poudre Dried fish powder	3	0.3336			0.19	0.67	
Takuwan	40	0.0976		2.42	0.14	2.03	
Total		1.1873	7.4206	19.04	2.28	6.82	129.692
Sardines (grillées) Sardine (broiled)	50	2.8675			4.35	5.18	
Pommes de terre (frites) Potato (fried)	70	0.2284		11.75	5.37	0.83	
Daikon	30	0.0250		0.31	0.04	0.08	
Takuwan	30	0.0732		1.81	0.10	1.52	
Total		3.1941	19.9631	13.87	9.86	7.61	230.413
Daikon	50	0.0417		0.51	0.07	0.14	
Tofu frit Fried Tofu	20	0.4933			6.07	0.19	
Oignon Onion	20	0.0360		1.39	0.06	0.11	
Poisson sec en poudre Dried fish powder	2	0.2224			0.12	0.45	
Shoyu	25 cc.	0.3642		1.39		4.63	
Oignon Onion	100	0.1800		6.95	0.29	0.56	
Tofu	60	0.5961		0.02	3.34	0.36	
Miso	38	0.4451		3.18	1.77	3.19	
Vinaigre Vinegar	40 cc.						
Sucre Sugar	15			14.85			
Takuwan	30	0.0732		1.81	0.10	1.52	
Total		2.4520	15.3250	30.10	11.82	11.15	296.169
Total journalier Daily total		6.8334	42.7087	63.01	23.96	25.58	656.274

: Miso: Sorte de pâte de haricots.
Tofu: est la protéïne coagulée des fèves de soy.
Satoimo: Variété de pomme de terre chinoise.
Shoyu: est une sauce salée préparée avec des fèves de soy.
Daikon: Variété de radis japonais.
Takuwan: Daikon mariné.

: Miso is a kind of bean paste.
Tofu is the protein curd of soy beans.
Sato mo is a kind of Chinese potato,
Shoyu is a salty sauce made from soy beans.
Daikon is a kind of Japanese radish.
Takuwan is pickled Daikon.

The whole of the urine passed during each 24-hour period was collected. Afte the volume, specific gravity and reaction of the urine had been taken, the urin was diluted to 2,000 cc. with distilled water to facilitate its analysis. To preserv the sample, a small quantity of toluene was added.

In order that the fæces corresponding to the foods ingested in each perio might be recognised, 0.5 gms. of carmine (Merk) or the same quantity of *carl sanguinis* (Merk) was given to the subject before breakfast.

The methods of analysis and the mode of calculation of the digestibility wer those commonly employed in metabolic experiments. The difference between th quantity of food ingested and the quantity excreted in the fæces was considere as the quantity digested. The digestibility was represented as a percentage ca culated from the quantity absorbed. It is possible, of course, to calculate th balance of total nitrogen from determinations of the total nitrogen in the urin It is very difficult to investigate the metabolism of carbohydrate or fat by determi ing merely the quantity present in the fæces; for this purpose it is advisable to mak observations by means of the respiratory calorimeter. This is being carried on another department under Director Saiki.

The following results were obtained:

Sujets Subject	Période Period	Absorption journalière moyenne d'azote N. intake Average per day Azote total (gr.) Total nitrogen (gms.)	 Protéine brute (gr.) Crude protein (gms.)	Elimination journalière moyenne d'azote N. output Average per day Azote dans l'urine (gr.) N. in urine (gms.)	 Azote dans les selles (gr.) N. in fæces (gms.)	Equilibre azoté Nitrogen Balance	Absorption moyenne par jour Absorption Average per day Azote (gr.) Nitrogen (gms.)	 Protéine (gr.) Protein (gms.)	 Calories	Pourcentage d'absorption % of absorption
Higuchi	Période préparatoire Preparatory period	11.4639	71.6493	10.6745	2.5020	— 1.7126	8.9619	56.0119	229.649	78.18
	Riz glacé Polished rice	11.5479	72.1743	10.6015	1.1858	— 0.2394	10.3621	64.7631	265.529	89.73
	Riz mi-glacé Half-pol. rice	12.8343	80.2143	10.8866	3.4222	— 1.4745	9.4121	58.8256	241.185	73.34
	Riz glacé à 70 % 70% pol. rice	12.5427	78.3918	10.9576	2.8958	— 1.3107	9.6469	60.2931	247.202	76.91
	Riz non glacé Unpolished rice	9.4169	58.8549	9,8618	2.9811	— 3.4260	6.4358	40.2238	164.918	68.34
	Après Latter	11.5479	72.1743	11.6466	2.0849	— 2.1836	9.4630	59.1438	242.490	81.95
Momoyeda	*Idem*	12.5863	78.6643	9.0309	2.4651	+ 1.0903	10.1212	63.2575	259.356	80.42
		12.7811	79.8818	10.2180	1.2536	+ 1.3095	11.5275	72.0469	295.392	90.19
		13.1541	82.2131	10.2591	2.5457	+ 0.3493	10.6084	66.3025	271.840	80.65
		14.0246	87.6537	10.3225	2.5751	+ 1.1270	11.4495	71.5594	293.375	81.64
		11.2351	70.2193	10.8750	2.9131	— 2.5530	8.3222	52.0138	213.257	74.06
		12.7811	79.8818	11.8472	1.0863	— 0.1524	11.6949	73.0931	299.682	91.50
Sugisaki	*Idem*	11.6207	72.6293	10.2532	1.7513	— 0.3838	9.8694	61.6838	252.804	84.93
		12.2009	76.2556	11.1768	1.6995	— 0.6754	10.5014	65.6338	269.099	86.07
		12.9071	80.6693	11.5814	2.4951	— 1.1694	10.4120	65.0750	266.808	80.67
		13.9398	87.1237	11.8886	2.3613	— 0.3101	11.5785	72.3656	296 699	83.06
		9.7721	61.0756	11.4781	3.4038	— 5.1098	6.3683	39.8019	163.188	65.17
		12.3943	77.4643	11.6520	2.2955	— 1.5532	10.0988	63.1175	258.782	81.48

Digestibility and Utilised Calories of Carbohydrate.

Sujets Subject	Période Period	Absorption journalière moyenne des hydr. de carbone (gr.) Carbohydrate intake Average per day (gms.)	Moyenne journalière des hydr. de carbone trouvés d. les selles (gr.) Carbohydrate in fæces Average per day (gms.)	Moyenne d'absorption journalière Absorption Average per day		Pourcentage d'absorption % of absorption
				Quantité (gr.) Quantity (gms.)	Calories	
Higuchi	Période préparatoire Preparatory period	421.61	1.7121	419.90	1721.590	99.59
	Riz glacé Polished rice	426.76	1.4095	425.35	1743.935	99.67
	Riz mi-glacé Half-pol. rice	398.92	2.5515	396.37	1625.117	99.36
	Riz glacé à 70% 70% pol. rice	427.72	4.0284	423.69	1737.129	99.06
	Riz non glacé Unpolished rice	209.46	6.8098	202.65	830.865	96.75
	Après Latter	426.76	1.8388	424.92	1742.172	99.56
Momoyeda	*Idem*	497.96	1.5299	496.43	2035.363	99.69
		517.91	1.4291	516.48	2117.568	99.72
		413.19	2.7013	410.49	1683.009	99.35
		519.11	4.1017	515.01	2111.541	99.21
		311.32	9.0704	302.25	1239.225	97.09
		517.91	1.4628	516.45	2117.445	99.72
Sugisaki	*Idem*	427.04	1.8849	425.16	1743.156	99.61
		472.48	1.8839	470.60	1929.460	99.60
		399.20	4.4592	394.74	1618.434	98.88
		503.93	3.2069	500.72	2052.952	99.36
		226.16	5.8012	220.36	903.476	97.43
		487.63	2.0916	485.54	1990.714	99.57

Digestibility and Utilised Calories of Crude Fat.

Sujets Subject	Période Period	Quantité moyenne de graisse absorbée par jour (gr.) Fat intake Average per day (gms.)	Quantité moyenne de graisse trouvée d. les selles par jour (gr.) Fat in fæces Average per day (gms.)	Absorption moyenne journalière Absorption Average per day		Pourcentage d'absorption % of absorption
				Quantité (gr.) Quantity (gms.)	Calories	
Higuchi .	Période préparatoire Preparatory period	26.92	3.6090	23.31	216.783	86.63
	Riz glacé . . . . Polished rice . .	26.96	2.2181	24.74	230.082	91.78
	Riz mi-glacé . . Half-pol. rice . .	29.96	5.4863	24.47	227.571	81.69
	Riz glacé à 70 % 70% pol. rice . .	29.36	4.8563	24.50	227.850	83.46
	Riz non glacé . Unpolished rice .	29.25	6.4672	22.78	211.854	77.88
	Après . . . . . Latter	26.96	2.6055	24.35	226.455	90.32
Momoyeda	*Idem*	27.54	2.9213	24.62	228.966	89.40
		27.71	2.2425	25.47	236.871	91.92
		30.21	6.0220	24.19	224.967	80.07
		30.71	4.8000	25.91	240.963	84.37
		32.92	9.7879	23.13	215.109	70.26
		27.71	2.1499	25.56	237.708	92.65
ugisaki .	*Idem*	26.96	2.6746	24.29	225.897	90.08
		27.34	2.4259	24.91	231.663	91.13
		29.96	5.6406	24.32	226.176	81.17
		30.49	4.1037	26.39	245.427	86.54
		29.84	7.3564	22.48	209.064	75.34
		27.46	2.4430	25.02	232.686	91.11

Digestibility of Crude Ash.

Sujets Subject	Période Period	Quantité moyenne de cendres absorbées par jour (gr.) Ash intake Average per day (gms.)	Quantité moyenne de cendres trouvées dans les selles par jour (gr.) Ash in fæces Average per day (gms.)	Absorption moyenne journalière (gr.) Absorption Average per day (gms.)	Pourcentag d'absorption % of absorption
Higuchi .	Période préparatoire . Preparatory period. .	27.80	3.5594	24.24	87.20
	Riz glacé . . . . . . Polished rice	27.94	2.4666	25.47	91.17
	Riz mi-glacé. . . . . . Half-polished rice . .	29.26	4.3220	24.94	85.23
	Riz glacé à 70%.. . . . 70% polished rice . .	28.66	4.4961	24.16	84.34
	Riz non glacé . . . . Unpolished rice . . .	28.77	4.9485	23.82	82.80
	Après . . . . . . Latter	27.94	2.2766	25.66	91.85
Momoyeda	*Idem*	29.86	3.0561	26.80	89.73
		29.22	1.9134	27.31	93.45
		29.36	5.5763	23.78	81.01
		30.12	4.4382	25.68	85.26
		31.26	6.5010	24.76	79.20
		29.22	2.3621	26.86	91.92
Sugisaki .	*Idem*	28.86	2.0686	26.79	92.83
		29.04	3.9330	25.11	86.46
		30.18	5.9678	24.21	80.22
		30.06	4.8665	25.19	83.81
		29.84	6.2832	23.56	78.94
		29.10	3.4342	25.67	88.20

Percentage of the Total Utilised Calories against the Total Calories Intake.

Sujets Subject	Période Period	Quantité journalière moyenne de calories absorbées Total calories intake Average per day	Nombre moyen de calories utilisées par jour Utilised calories Average per day	Pourcentage utilisé des calories absorbées % of utilised calories against total calories intake
Higuchi	Période préparatoire Preparatory period	2272.885	2168.022	95.34
	Riz glacé Polished rice	2296.399	2239.149	97.50
	Riz mi-glacé Half-pol. rice	2243.119	2093.873	93.34
	Riz glacé à 70 % 70 % pol. rice	2348.133	2212.181	94.21
	Riz non glacé Unpolished rice	1372.156	1207.637	88.01
	Après Latter	2296.399	2211.117	96.28
Momoyeda	*Idem*	2606.628	2523.685	96.82
		2708.688	2649.831	97.82
		2312.145	2179.816	93.84
		2773.373	2645.879	95.40
		1870.506	1667.591	89.15
		2708.688	2654.835	98.01
Sugisaki	*Idem*	2299.411	2221.857	96.62
		2504.117	2427.222	96.93
		2246.131	2111.418	94.00
		2706.916	2595.078	95.86
		1455.217	1275.728	87.66
		2572.263	2482.182	96.50

Average Means of the Digestibility and Percentage of the Total Utilised Calories.

Période Period	Azote total Total nitrogen %	Hydrates de carbone Carbo-hydrate %	Graisse brute Crude fat %	Cendres brutes Crude ash %	Calories utilisées Utilised calories %
iz glacé olished rice	88.663	99.663	91.610	90.360	97.417
iz glacé à 70 %) % polished rice	80.537	99.210	84.970	84.460	95.157
iz mi-glacé alf-polished rice	78.220	99.197	80.977	82.153	93.727
iz non glacé npolished rice	69.190	97.090	74.493	80.313	88.273

The mean value obtained for each constituent in each period is taken as repre senting the digestibility of the corresponding constituent in the different grades o rice. If the crude rice is represented by 100 parts, then the yields of the variou grades of polished rice are: polished rice 92.74 parts, 70%-polished rice 94.53 part and half-polished rice 95.81 parts. The absolute digestible quantity of eac constituent of the rice and its absolute output in the fæces were calculated fror these data; the results are as shown in the following table:

		Riz glacé cuit Boiled polished rice	Riz glacé à 70 % cuit Boiled 70%-polished rice	Riz mi-glacé cuit Boiled half-polished rice	Riz non glacé cuit Boiled unpolished rice
Quantité fournie par 100 gr. de riz non décortiqué (cru) Amount obtained from 100 gms. of unpolished rice (uncooked)		197.12	215.50	212.98	230.87
Azote total Total nitrogen	Pourcentage Percentage	0.3868	0.4697	0.4940	0.5320
	Quantité Amount	0.7625	1.0122	1.0521	1.2282
	Pourcent. d'absorption % of absorption	88.663	80.537	78.220	69.190
	Quantité absorbée Amount of absorption	0.6761	0.8152	0.8229	0.8498
	Quantité trouvée dans les selles Amount in fæces	0.0864	0.1970	0.2292	0.3784
Hydrates de carbone Carbo-hydrate	*Idem*	30.29 59.71 99.663 59.51 0.20	30.37 65.45 99.210 65.03 0.42	27.97 59.57 99.197 59.15 0.42	30.97 71.50 97.090 69.42 2.08
Graisse brute Crude fat	*Idem*	0.25 0.49 91.610 0.45 0.04	0.45 0.97 84.970 0.82 0.15	0.50 1.06 80.977 0.86 0.20	1.12 2.58 74.493 1.92 0.66
Cendres brutes Crude ash	*Idem*	0.12 0.23 90.360 0.20 0.03	0.18 0.39 84.460 0.33 0.06	0.23 0.49 82.153 0.40 0.09	0.48 1.11 80.313 0.89 0.22

Conclusion.

1. The digestibility and utilisation of rice are always better when the grades of polishing are higher.

The ratio of the actual energy derived from the rice to the total energy value of the rice eaten varies directly with the digestibility.

2. Under standard conditions the absolute output in the fæces of each ingredient of the rice is always smaller when the rice is polished to a higher grade.

The ratio of the absolute digestible quantity of the respective constituents to the output of each in the fæces is notably high in the case of unpolished rice, and it is always smaller when the polishing grade is higher.

3. The quantity of unpolished rice eaten to supplement a diet consisting of the same side dishes is far smaller than the quantity of rice of various grades of polishing ingested under the same conditions. It appears that, in the unpolished rice period, not only is the caloric value insufficient for the requirements of the body, but the absolute output of food in the fæces is greater than in any of the other periods when rice of various grades of polishing is eaten; the nitrogen balance under these circumstances is almost always negative. If the quantity of rice taken were the same in every period, the differences in the degrees of digestibility and utilisation would be much greater.

SECOND REPORT.

Introduction.

This work was carried out to supplement the data recorded in our first report. Formerly, each experiment lasted 13 days and the digestibilities of polished rice, 70%-polished rice, half-polished rice and unpolished rice were compared simultaneously. Here, however, instead of comparing all the grades of rice in one experiment, I selected for each experiment two kinds of rice polished in different grades. This time each experiment lasted six days; on the first two days (the preparatory period) and the last two days, the subjects were given the same kind of rice; during the two days between these periods the rice taken was of a different grade of polishing. In the morning of the seventh day of the experiment, the subjects ate the same kind of rice as on the last two days.

Six experiments were carried out, involving the comparison of polished rice with 70%-polished rice, polished rice with half-polished rice, polished rice with unpolished rice, 70%-polished rice with half-polished rice, and half-polished rice with unpolished rice.

The general methods of the experiment were the same as those described in our first report.

The side dishes employed in the previous experiment were altered in such a way as to change the quality and quantity of the nitrogenous constituents. They were prepared and cooked as shown in the next table. During each experiment a definite and uniform quantity of these dishes was taken.

The side dishes and their constituents were as follows:

Meal	Side dishes	Materials	Quantity
Morning	Miso soup	Wakame	20 gms.
		Miso	38 »
		Dried fish powder	3 »
		Water	300 cc.
	Fuki (boiled)		30 gms.
	Takuwan		30 gms.
Noon	Nitsuke (Stew)	Pork	50 gms.
		Potato (s skins)	100 »
		Burdock	30 »
		Tofu (toasted)	50 »
		Shoyu	40 cc.
		Sugar	30 gms.
		Water	300 cc.
	Daikon (grated)	Daikon	30 gms.
		Shoyu	5 cc.
Evening	Soup	Tofu	100 gms.
		Dried fish powder	3 »
		Shoyu	25 cc.
		Water	300 »
	Nuta (fish salad)	Mackerel	40 gms.
		Cabbage	25 »
		Onion	15 »
		Miso	20 »
		Vinegar	20 cc.
		Sugar	15 gms.
	Takuwan		30 gms.

Note: Fuki is *Petasites japonicus.*

In the above side dishes, there were the following constituents:

	Azote total Total Nitrogen	Protéine brute Crude protein	Hydrates de carbone (comme le glucose) Carbo-hydrate as glucose	Graisse brute Crude fat	Cendres brutes Crude ash	Calorie
Morning — Matin	1.2491	7.8069	13.91	2.94	9.71	116.38
Noon — Midi . .	3.5907	22.4419	46.96	3.25	9.05	314.77
Evening — Soir .	2.7329	17.0806	20.32	7.67	9.29	244.63
Total . .	7.5727	47.3294	81.19	13.86	29.05	655.82

Experiment I.

THE COMPARISON OF THE DIGESTIBILITY OF 70%-POLISHED RICE AND UNPOLISHED RICE.

In this experiment, five men were used as subjects and the following results were obtained:

Daily Output of the Total Nitrogen and the Distribution of Nitrogenous Constituents in the Urine.

Sujets Subjects	Période Period	Date	Azote total Total N. (g)	Azote de l'urée Urea N. (g)	Azote de l'urée Urea N. (%)*	Azote de NH_3 Ammonia N. (g)	Azote de NH_3 Ammonia N. (%)*	Azote de l'acide urique Uric acid N. (g)	Azote de l'acide urique Uric acid N. (%)*	Azote des bases puriques Purin base N. (g)	Azote des bases puriques Purin base N. (%)*	Azote des acides aminés Amino acid N. (g)	Azote des acides aminés Amino acid N. (%)*	Azote de la créatinine Creatinin N. (g)	Azote de la créatinine Creatinin N. (%)*	Azote de la créatine Creatin N. (g)	Azote de la créatine Creatin N. (%)*
Hara	Riz glacé Polished rice	Mai- 14	8.8189	7.1003	80.51	0.1888	2.14	0.0242	0.27	0.1722	1.96	0.4914	5.57	0.5628	6.38	0.0107	0 12
		May 15	9.1865	7.0142	76.35	0.2275	2.48	0.0166	0.18	0.2262	2.46	0.3780	4.12	0.5653	6.15	0.0192	0.20
		Moy-Aver	9.0027	7.0573	78 43	0.2082	2.31	0.0204	0.23	0.1992	2.21	0.4347	4.85	0.5641	6.27	0.0150	0.16
	Riz glacé à 70% 70% pol rice	16	9.6462	7.3536	76.23	0.2225	2.31	0.0204	0.21	0.2067	2.14	0.5670	5.88	0.5576	5.78	0.0105	0.11
		17	9.0844	7.9206	87.30	0.2325	2.56	0.0242	0.27	0.1839	2.03	0.5954	6.55	0.5576	6.13	0.0105	0.11
		Moy-Aver	9.3653	7 6371	81.77	0.2275	2.44	0.0223	0.24	0.1953	2.09	0.5812	6.23	0.5576	5.96	0.0105	0.11
	Riz décortiqué Polished rice	18	9.1358	6.8106	74.54	0.1634	1.79	0.0217	0.24	0.1556	1.76	0.6710	7.34	0.5903	6.46	0.0116	0.12
		19	9 3906	7.3845	78.64	0.1380	1.47	0.0268	0.29	0.1608	1.71	0.4064	4.33	0.5601	5.96	0 0134	0 14
		Moy-Aver	9.2632	7.0975	76.59	0.1507	1.63	0.0243	0.27	0.1582	1.74	0.5387	5.84	0 5752	6 21	0.0125	0.13
Higuchi	Riz glacé Polished rice	14	9.7479	7.8208	80.23	0.1988	2.04	0.0249	0.25	0.1607	1.65	0.5198	5.33	0.5474	5.61	0.0153	0.15
		15	11.4321	8.4673	74.07	0.2325	2.03	0.0191	0.17	0.2157	1.89	0.4725	4.13	0.5628	4.92	0.0107	0.09
		Moy-Aver	10.5900	8.1441	77.65	0.2157	2.04	0.0220	0.21	0.1882	1.77	0.4962	4.73	0.5551	5.27	0.0130	0.12
	Riz glacé à 70% 70% pol. rice	16	11.2038	8.8674	79.15	0.1513	1.35	0 0191	0.17	0 2126	1.60	0.6166	5.50	0.5524	4.93	0.0103	0.09
		17	10.1606	8.0855	79.76	0.1970	1.94	0.0255	0.25	0.2328	2.29	0.5954	5.86	0.5628	5.54	0.0164	0.16
		Moy-Aver	10.6822	8.4765	79.46	0.1742	1.65	0.0223	0.21	0.2227	1.95	0.6060	5.68	0.5576	5.24	0.0134	0 13
	Riz glacé Polished rice	18	10.8790	7.6536	70.36	0.1704	1.57	0.0230	0.21	0.1674	1.54	0.6166	5.67	0.5762	5.30	0.0141	0.13
		19	9.9560	7.3274	73.70	0.1310	1.33	0.0219	0.23	0.1694	1.75	0.4725	4.75	0.5735	5.76	0.0112	0.11
		Moy-Aver	10.4175	7.4905	72.03	0.1507	1.46	0.0225	0.21	0.1684	1.65	0.5448	5.21	0.5749	5.53	0.0127	0.12
Momoyeda	Riz glacé Polished rice	14	10.6665	8.3907	78.66	0.2050	1.92	0.0306	0.29	0.2067	1.95	0.5670	5.32	0.6022	5.64	0.0123	0.11
		15	10.5134	6.9105	65.82	0.2063	1.01	0.0204	0.19	0.2194	2.09	0.6143	5.84	0.6082	5.78	0.0125	0.12
		Moy-Aver	10.5900	7.6506	72.24	0.2057	1.47	0.0255	0.24	0.2131	2.02	0.5907	5.58	0.6052	5.71	0.0124	0.12
	Riz glacé à 70 % 70% pol. rice	16	10.7686	7.7112	71.61	0.1925	1.79	0.0242	0.22	0.2126	1.98	0.5953	5.53	0.6144	5.70	0.0129	0.12
		17	9.5477	7.2109	75.52	0.1542	1.62	0.0204	0.21	0.2094	2.20	0.6899	7.23	0.6273	6.57	0.0133	0.14
		Moy-Aver	10.1582	7.4610	73.57	0.1734	1.71	0.0223	0.22	0.2110	2.09	0.6426	6.38	0.6209	6.14	0.0131	0.13

* % de l'azote total. — % against total N.

(Continuation.)

Sujets Subjects	Période Period	Date	Azote total Total N. (g)	Azote de l'urée Urea N. (g)	Azote de l'urée Urea N. (%)*	Azote de NH^3 Ammonia N. (g)	Azote de NH^3 Ammonia N. (%)*	Azote de l'acide urique Uric acid N. (g)	Azote de l'acide urique Uric acid N. (%)*	Azote des bases purique Purin base N. (g)	Azote des bases purique Purin base N. (%)*	Azote des acides aminés Amino acid N. (g)	Azote des acides aminés Amino acid N. (%)*	Azote de la créatinine Creatinin N. (g)	Azote de la créatinine Creatinin N. (%)*	Azote de la créatine Creatin N. (g)	Azote de la créatine Creatin N. (%)*
Monoyeda	Riz glacé Polished rice	Mai-May 18	9.4417	7.1626	75.85	0.1866	1.98	0.0255	0.27	0.1608	1.71	0.4914	5.20	0.6273	6.64	0.0202	0.21
		19	10.5644	7.3315	69.14	0.1333	1.26	0.0193	0.18	0.1608	1.53	0.4347	4.11	0.6207	5.87	0.0198	0.19
		Moy-Aver	10.0031	7.2471	72.63	0.1600	1.62	0.0224	0.23	0.1608	1.62	0.4631	4.66	0.6240	6.26	0.0200	0.20
Sugisaki	Riz glacé Polished rice	14	10.7176	8.4809	79.13	0.2550	2.38	0.0217	0.20	0.1730	1.62	0.5165	4.82	0.5762	5.37	0.0141	0.13
		15	9.9560	7.1384	71.70	0.2600	2.61	0.0153	0.15	0.2309	2.33	0.4725	4.74	0.5735	5.76	0.0169	0.17
		Moy-Aver	10.3368	7.8097	75.42	0.2575	2.49	0.0185	0.18	0.2020	1.98	0.4945	4.78	0.5749	5.57	0.0155	0.15
	Riz glacé à 70 % 70%-pol. rice	16	8.9193	6.8374	76.66	0.1725	1.93	0.0204	0.23	0.1882	2.06	0.4335	4.75	0.4538	5.09	0.0094	0.10
		17	12.8651	9.7296	75.62	0.2027	1.58	0.0253	0.20	0.2592	2.01	0.6710	5.29	0.7792	6.05	0.0265	0.20
		Moy-Aver	10.8922	8.2835	76.14	0.1876	1.76	0.0229	0.22	0.2237	2.04	0.5523	5.02	0.6165	5.57	0.0180	0.15
	Riz glacé Polished rice	18	10.4113	7.6281	73.27	0.1588	1.53	0.0206	0.19	0.2488	2.39	0.6426	6.16	0.5790	5.56	0.0172	0.16
		19	10.6669	7.6159	71.39	0.1358	1.27	0.0241	0.23	0.1503	1.36	0.4914	4.61	0.5790	5.42	0.0172	0.16
		Moy-Aver	10.5391	7.6220	72.33	0.1473	1.40	0.0224	0.21	0.1996	1.88	0.5670	5.39	0.5790	5.49	0.0172	0.16
Tanaka	Riz glacé Polished rice	14	10.2582	7.2064	70.25	0.1950	1.90	0.0179	0.17	0.1644	1.62	0.4347	4.24	0.5251	5.12	0.0700	0.68
		15	10.0581	6.8650	68.25	0.2175	2.16	0.0166	0.17	0.1571	1.56	0.5198	5.17	0.5251	5.22	0.0760	0.75
		Moy-Aver	10.1582	7.0357	69.25	0.2063	2.03	0.0173	0.17	0.1608	1.59	0.4773	4.71	0.5251	5.17	0.0730	0.72
	Riz glacé à 70 % 70%-pol. rice	16	10.0581	7.7412	76.96	0.2188	2.18	0.0204	0.20	0.2188	2.18	0.5387	5.36	0.5251	5.22	0.0760	0.75
		17	9.2375	7.7754	84.17	0.1950	2.10	0.0223	0.25	0.1608	1.74	0.4725	5.11	0.5377	5.82	0.0645	0.70
		Moy-Aver	9.6478	7.7583	80.57	0.2069	2.14	0.0214	0.23	0.1898	1.96	0.5056	5.24	0.5314	5.52	0.0703	0.73
	Riz glacé Polished rice	18	9.9050	8.0083	80.85	0.1519	1.53	0.0215	0.22	0.1725	1.79	0.4253	4.29	0.5377	5.43	0.0645	0.65
		19	9.2886	7.2607	78.06	0.1299	1.40	0.0232	0.26	0.1574	1.69	0.4725	5.09	0.5251	5.65	0.0760	0.81
		Moy-Aver	9.5968	7.6345	79.46	0.1409	1.47	0.0224	0.24	0.1645	1.74	0.4489	4.69	0.5314	5.54	0.0703	0.73

* % de l'azote total — % against total N

The Daily Output of SO_3, P_2O_5, and NaCl in the Urine.

Période Period	Date	Hara			Higuchi		
		SO_3 (g)	P_2O_5 (g)	NaCl (g)	SO_3 (g)	P_2O_5 (g)	NaCl (g)
	Mai-May						
glacé	14	1.6391	1.2449	22.770	1.8146	1.5918	23.245
ished rice	15	1.7611	1.2445	23.760	1.9209	1.8980	24.851
	Moyenne –Aver.	1.7001	1.2447	23.265	1.8678	1.7449	24.048
glacé	16	1.6679	1.5918	21.780	1.7838	1.6938	25.265
70%	17	1.4649	1.6735	22.384	1.9888	1.5102	22.572
pol. rice	Moyenne –Aver.	1.5664	1.6327	22.082	1.8863	1.6020	23.919
	18	1.5883	1.2041	24.354	1.8270	1.5918	22.265
glacé	19	1.5238	1.4286	24.060	1.1761	1.5510	24.750
shed rice	Moyenne –Aver.	1.5561	1.3164	24.207	1.5016	1.5714	25.008

ériode eriod	Date	Momoyeda			Sugisaki			Tanaka		
		SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3 (g)	P_2O_5(g)	NaCl(g)	SO_3 (g)	P_2O_5(g)	NaCl(g)
	Mai-May									
lacé	14	1.8215	1.6122	24.354	1.8942	1.6938	22.473	1.6926	1.0816	22.178
ıed rice	15	1.8407	1.4286	20.790	1.8791	1.8367	21.309	1.8098	1.5510	22.770
	Moyenne –Aver.	1.8311	1.5204	22.572	1.8867	1.7653	21.891	1.7512	1.3163	22.474
lacé	16	1.7156	1.6122	20.295	1.4470	1.4890	20.885	1.9292	1.6938	23.800
%	17	1.7406	1.6938	22.968	2.2058	2.3122	22.275	1.6994	1.3877	20.889
ol. rice	Moyenne –Aver.	1.7281	1.6530	21.632	1.8264	1.9006	21.580	1.8143	1.5408	22.345
	18	1.7556	1.4286	22.178	1.8455	1.6938	20.885	1.6452	1.3673	24.948
acé	19	1.7537	1.4694	20.885	1.6631	1.7347	21.879	1.5636	1.5918	24.150
ed rice	Moyenne –Aver.	1.7547	1.4490	21.532	1.7543	1.7143	21.382	1.6044	1.4796	24.549

Nitrogen Balance: the Digestibility and Utilisation and Caloric Value.

Sujets Subject	Période Period	Absorption d'azote Moyenne journalière N. intake Average per day		Azote trouvé dans l'urine Moyenne journalière N. in urine Average per day		Azote trouvé dans les selles Moyenne journalière N. in fæces Average per day		Gains ou pertes en azote Nitrogen balance	Absorption Moyenne journalière Absorption Average per day			Pourcentage d'absorption % of absorption
		Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake		Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Calories	
Hara . . .	Riz glacé Polished rice	12.4411	77.7569	9.0027	72.36	1.7898	14.39	+ 1.6486	10.6513	66.5706	272.939	85.61
	Riz glacé à 70% 70% pol. rice	14.1289	88.3057	9.3653	66.28	2.3488	16.62	+ 2.4148	11.7806	73.6257	301.865	83.38
	Riz glacé Polished rice	13.2525	82.8282	9.2632	69.90	1.9331	14.58	+ 2.0562	11.3194	70.7463	290.060	85.42
Higuchi . .	*Idem*	13.2525	82.8282	10.5900	79.92	1.9023	14.35	+ 0.7602	11.3502	70.9388	290.849	85.65
		14.1289	88.3057	10.6822	75.60	2.1948	15.53	+ 1.2519	11.9341	74.5872	305.808	84.47
		13.4554	84.0963	10.4175	77.42	1.8821	13.98	+ 1.1558	11.5733	72.0332	296.676	86.02
Momoyeda .	*Idem*	13.0497	81.5607	10.5900	81.15	1.9690	15.08	+ 0.4907	11.0807	69.2554	283.948	84.92
		14.1289	88.3057	10.1582	71.90	3.3024	23.30	+ 0.6683	10.8265	67.6657	277.429	76.70
		13.2525	82.8282	10.0031	75.48	2.0464	15.52	+ 1.2030	11.2061	70.0382	287.157	84.48
Sugisaki . .	*Idem*	12.6440	79.0250	10.3368	81.75	2.1579	17.06	+ 0.1493	10.4861	66.5381	272.806	82.91
		13.8948	86.8425	10.8922	78.39	2.3126	16.64	+ 0.6900	11.5822	72.5887	298.614	83.36
		13.2525	82.8282	10.5391	79.53	1.8038	13.61	+ 0.9096	11.4487	71.5544	293.373	86.39
Tanaka . .	*Idem*	12.4411	77.7569	10.1582	81.66	1.6241	13.05	+ 0.6588	10.8170	67.6063	277.186	86.95
		14.1289	88.3057	9.6478	68.28	2.3774	11.83	+ 2.1037	11.7515	73.4469	301.132	83.17
		13.2525	82.8282	9.5968	72.42	2.0689	15.68	+ 1.5868	11.1836	69.8976	287.580	84.32

The Digestibility and Utilisation of the Carbohydrate (as Glucose) and its Caloric Value.

Sujets Subject	Période Period	Absorption des hydrates de carbone Moy. jour. (gr.) Carbohydrate intake Average per day (gms.)	Hydrates de carb. élim. dans les selles Moyenne journal. Carbohydrate in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
Hara . .	Riz glacé Polished rice	457.63	0.9628	0.21	456.67	1872.347	99.79
	Riz glacé à 70% 70% pol. rice	485.09	1.8438	0.38	483.25	1982.325	99.62
	Riz glacé Polished rice	520.37	1.7743	0.34	518.60	2126.260	99.66
Higuchi .	*Idem*	520.37	1.1468	0.22	519.22	2128.802	99.78
		485.09	1.8184	0.37	483.27	1982.407	99.63
		536.06	1.5686	0.29	534.49	2192.409	99.71
Momoyeda	*Idem*	504.64	1.0044	0.19	503.64	2064.924	99.81
		485.09	2.4593	0.50	482.63	1978.783	99.50
		520.37	1.8713	0.35	518.50	2125.850	99.65
Sugisaki .	*Idem*	473.32	1.3191	0.28	472.00	1935.200	99.72
		470.67	1.6987	0.36	468.97	1922.777	99.64
		520.37	1.8883	0.36	518.48	2125.768	99.64
Tanaka .	*Idem*	457.63	1.1214	0.24	456.51	1871.691	99.76
		485.09	1.8106	0.37	483.28	1981.448	99.63
		520.37	1.6314	0.31	518.74	2126.834	99.69

Digestibility and Utilisation of Crude Fat.

Sujets Subject	Période Period	Absorption de la graisse Moy. jour. (gr.) Fat intake Average per day (gms.)	Graisse trouvée dans les selles Moyenne journal. Fat in fæces Average per day		Absorption moyenne journalière Absorption Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
Hara . .	Riz glacé Polished rice	16.02	1.9097	11.92	14.11	131.223	88.08
	Riz glacé à 70% 70% pol. rice	18.90	3.8379	20.31	15.06	140.058	79.69
	Riz glacé Polished rice	16.38	2.8657	17.50	13.51	125.643	82.50
Higuchi .	*Idem*	16.38	2.5375	15.49	13.84	128.712	84.51
		18.90	2.8791	15.30	16.02	148.986	84.70
		16.47	2.2304	13.54	14.24	132.432	86.46
Momoyeda	*Idem*	16.29	1.7289	10.61	14.56	135.408	89.39
		18.90	4.5053	23.83	14.39	133.827	76.17
		16.38	2.4915	15.21	13.89	129.177	84.79
Sugisaki .	*Idem*	16.06	2.0346	12.67	14.03	130.479	87.33
		18.72	3.0194	16.61	15.70	146.010	83.39
		16.38	1.9642	11.98	14.41	134.013	88.02
Tanaka .	*Idem*	16.02	1.7332	10.82	14.29	132.897	89.18
		18.90	4.4907	23.75	14.41	134.013	76.25
		16.38	2.1345	13.03	14.25	132.525	86.97

Digestibility and Utilisation of Crude Ash.

Sujets Subject	Période Period	Absorption des cendres Moy. journ. (gr.) Ash intake Average per day (gms.)	Cendres trouvées dans les selles Moyenne journalière Ash in fæces Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	
Hara . . .	Riz glacé	30.49	2.5215	8.27	91.73
	Polished rice				
	Riz glacé à 70% . . .	31.29	3.8054	12.16	87.84
	70% polished rice . .				
	Riz glacé	30.73	2.4029	7.82	92.18
	Polished rice				
Higuchi .	*Idem*	30.73	3.2844	10.68	89.32
		31.29	3.3639	10.75	89.25
		30.79	2.6655	8.66	91.34
Homoyeda	*Idem*	30.67	3.5922	11.71	88.29
		31.29	4.8981	15.65	84.35
		30.73	3.5597	11.58	88.42
Igisaki .	*Idem*	30.55	3.6202	11.85	88.15
		31.21	3.8793	12.43	87.57
		30.73	3.1250	10.17	89.83
Inaka .	*Idem*	30.49	2.5717	8.43	91.57
		31.29	5.0214	16.04	83.96
		30.73	3.0204	9.82	90.18

Percentage of the Caloric Value of Food actually utilised by the Body.

Sujets Subject	Période Period	Absorption des calories Moyenne journalière Calories intake Average per day		Utilisation des calories Calories utilisation		% de l quantit de calori absorbé
		Calories totales Total calories	Par kg. du poids Per kg. of body weight	Calories totales Total calories	Par kg. du poids Per kg. of body weight	% again calorie intake
Hara . .	Riz glacé . . . Polished rice . .	2344.072	42.45	2276.509	41.22	97.11
	Riz glacé à 70% 70% pol. rice . .	2526.692	45.79	2424.248	43.93	95.9
	Riz glacé . . . Polished rice . .	2625.446	47.43	2542.503	45.93	96.8
Higuchi .	*Idem*	2625.446	50.44	2548.363	48.96	97.6
		2526.692	48.28	2437.201	46.55	96.4
		2695.811	51.47	2621.517	50.04	97.2
Momoyeda	*Idem*	2555.124	44.56	2484.280	43.33	98.0
		2526.692	43.96	2390.039	41.58	94.5
		2625.446	45.74	2542.184	44.29	96.8
Sugisaki .	*Idem*	2414.437	44.96	2338.485	43.73	96.4
		2459.897	46.02	2367.401	44.29	96.2
		2625.446	48.98	2553.154	47.63	97.2
Tanaka .	*Idem*	2349.072	44.70	2281.774	43.42	97.1
		2526.692	47.87	2416.593	45.78	95.6
		2625.446	49.88	2546.939	48.39	97.0

I. *Comparison of Polished Rice with 70%-polished Rice.*

The percentages of digestibility and utilised calories were as follows:

Period	Total Nitrogen	Carbo-hydrate	Crude fat	Crude ash	Calories
Preparatory	85.214	99.772	87.698	89.812	97.266
70% polished rice . . .	82.216	99.604	80.040	86.594	95.776
Polished rice	85.326	99.670	85.748	90.392	97.026

The mean of each constituent in each period is taken as representing the digestibility of the particular grade of rice.

The absolute digestibility of each constituent of the rice and the absolute output of each in the fæces have been calculated. The results are as shown in the following table:

		Riz glacé cuit Boiled polished rice	Riz glacé à 70 %, cuit Boiled 70 % polished rice
Quantité fournie par 100 gr. de riz non glacé . . Amount obtained from 100 gms. of unpolished rice		228.16	235.04
Azote total Total nitrogen	Pourcentage — Percentage	0.4057	0.4683
	Quantité — Amount	0.9256	1.1007
	Pourcentage de digestibilitée . . . % of digestibility	85.326	82.216
	Quantité totale utilisée. . . . . . Total amount utilised	0.7898	0.9049
	Total trouvé dans les selles . . . . Total in the fæces	0.1358	0.1958
Hydrocarbures	*Idem*	31.37	28.85
Carbohydrate		71.57 99.670	67.81 99.604
		71.33	67.54
		0.24	0.27
Graisses brutes Crude fat	*Idem*	0.18 0.41	0.36 0.85
		85.748	80.040
		0.35	0.68
		0.06	0.17
Cendres brutes Crude ash	*Idem*	0.12 0.27	0.16 0.38
		90.392	86.594
		0.24	3.33
		0.03	0.04

Experiment II.

E Comparison of the Digestibility of Half-polished Rice and Polished Rice.

In this experiment, five men were used as subjects and the following results re obtained:

Daily Output of the Total Nitrogen and the Distribution of Nitrogenous Constituents in the Urine.

Sujets Subjects	Période Period	Date	Azote total Total N. (g)	Azote de l'urée Urea N. (g)	(%)	Azote de NH_3 Ammonia N. (g)	(%)	Azote de l'acide urique Uric acid N. (g)	(%)	Azote des bases puriques Purin base N. (g)	(%)	Azote des acides aminés Amino acid N. (g)	(%)	Azote de la créatinine Creatinin N. (g)	(%)	Azote de la créatine Creatin N. (g)	(%)
Hara	Riz glacé Polished rice	28 & 29	8.6360	6.8457	79.32	0.1401	1.62	0.0149	0.17	0.2144	2.48	0.5859	6.78	0.6176	7.15	0.0092	0.10
		Mai – May	8.9703	6.8885	76.79	0.1229	1.36	0.0087	0.10	0.1572	1.76	0.6237	6.74	0·5903	6.58	0.0116	0.13
		Moy-Aver	8.8032	6.8671	78.06	0.1315	1.49	0.0118	0.14	0.1858	2.12	0.6048	6.76	0.6040	6.87	0.0104	0.12
	Riz mi-glacé Half-pol. rice	30	9.5832	7.4791	78.04	0.1707	1.79	0.0156	0.16	0.2185	2.28	0.7088	7.40	0.5961	6.22	0.0121	0.12
		31	9.4200	6.8769	73.00	0.0984	1.04	0.0073	0.08	0.2681	2.84	0.6804	7.22	0.5628	6.97	0.0107	0.11
		Moy-Aver	9.5016	7.2780	75.52	0.1346	1.42	0.0115	0.12	0.2433	2.56	0.6940	7.31	0.5795	6.10	0.0114	0.12
	Riz glacé Polished rice	1 & 2	9.6389	7.0027	72.65	0.1744	1.81	0.0101	0.10	0.1538	1.60	0.6710	6 96	0.6022	6.25	0.0123	0.13
		Juin-June	9.5832	6.9404	72.42	0.1425	1.49	0.0184	0.19	0.2381	2.48	0.6332	6.61	0.6082	6.35	0.0125	0.13
		Moy-Aver	9.6111	6.9716	72.54	0.1585	1.65	0.0143	0.15	0.1960	2.01	0.6521	6.79	0.6052	6.30	0.0124	0.13
Higuchi	Riz glacé Polished rice	28 & 29	8.4131	6.7478	80.21	0.0776	0.92	0.0126	0.15	0.2026	2.41	0.7088	8.43	0.5961	7.08	0.0183	0.21
		Mai – May	8.8031	7.1177	80.85	0.0911	1.35	0.0121	0.14	0.1535	1.74	0.6614	7.51	0.5549	6.30	0.0112	0.13
		Moy-Aver	8.6081	6.9328	80.53	0.0844	1.14	0.0124	0.15	0.1781	2.08	0.6851	7.97	0.5755	6.69	0.0148	0.17
	Riz mi-glacé Half-pol. rice	30	10.1403	8.1490	80.36	0.1584	1.56	0.0114	0.11	0.2209	2.18	0.7088	6.99	0.5790	5.71	0.0114	0.11
		31	10.2546	8.7086	84.93	0.1226	1.20	0.0159	0.13	0.2463	2.40	0.8222	8.02	0 5680	5.53	0.0109	0.11
		Moy-Aver	10.1975	8.4288	82.65	0.1450	1.38	0.0137	0.12	0.2336	2.29	0.7655	7.51	0.5735	5.62	0.0112	0.11
	Riz glacé Polished rice	1 & 2	9.4717	7.7799	82.14	0.1180	1.25	0.0170	0.28	0.2014	2.13	0.6804	7.18	0.5680	5.99	0.0109	0.11
		Juin-June	10.3603	7.3205	70.66	0.1278	1.23	0.0073	0.07	0.2068	1.99	0.6143	5.90	0.5735	5.53	0.0169	0.16
		Moy-Aver	9.9160	7.5502	76.40	0.1229	1.24	0.0122	0.18	0.2041	2.06	0.6474	6.54	0.5708	5.76	0.0139	0.14
[illegible]		28 & 29	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Sujets Subjects	Période Period	Date	Azote total Total N. (g)	Azote de l'urée Urea N.		Azote de NH^3 Ammonia N.		Azote de l'acide urique Uric acid N.		Azote des bases puriques Purin base N.		Azote des acides aminés Amino acid N.		Azote de la créatinine Creatinin N.		Azote de la créatine Creatin N.	
				(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
Momoyeda	Riz mi-glacé	30 & 31	10.1489	7.6559	75.44	0.1744	1.72	0.0142	0.13	0.2209	2.17	0.9356	9.23	0.6273	6.16	0.0133	0.13
	Half-pol. rice	Mai-May	9.9684	7.0072	70.30	0.1499	1.51	0.0107	0.11	0.2383	2 44	0.5426	5.45	0.6338	6.37	0.0137	0.13
		Moy-Aver	10.0587	7.3316	72.87	0.1622	1.62	0.0125	0.12	0.2296	2.31	0.7391	7.34	0.6306	6.27	0.0135	0.13
	Riz glacé	1 & 2	9.1971	7.2386	78.71	0.1425	1.55	0.0087	0.09	0.1959	2.13	0.7277	7.92	0.6144	6.64	0.0129	0.14
	Polished rice	Juin-June	10.5860	7.0407	66.51	0.1352	1 28	0.0226	0.22	0.2540	2.40	0.6332	5.96	0.6842	6.46	0.0242	0.23
		Moy-Aver	9.8916	7.1397	72.61	0.1389	1.42	0.0157	0.16	0.2250	2.27	0.6805	6.94	0.6493	6.55	0.0186	0.19
Sugisaka	Riz glacé	28 & 29	11.7561	7.3572	62.58	0.1695	1.44	0.0184	0.16	0.2417	2.06	0.6699	5.70	0.6082	5.17	0.0125	0.11
	Polished rice	Mai-May	11.3103	8.1148	71.76	0.1327	1.17	0.0101	0.09	0.2280	2.01	0.5765	5.10	0.6022	5.32	0.0123	0.11
		Moy-Aver	11.5332	7.7360	67.17	0.1511	1.31	0.0143	0.13	0.2349	2.04	0.6232	5.40	0.6052	5.25	0.0124	0.11
	Riz mi-glacé	30	10.6975	8.5501	79.91	0.1817	1.70	0.0156	0.15	0.2584	2.42	0.7088	6.63	0.6022	5.63	0.0184	0.17
	Half-pol. rice	31	12.4247	9.8140	79.00	0.1425	1.15	0.0099	0.09	0.2794	2.20	0.7371	5.77	0.6022	4.84	0.0184	0.14
		Moy-Aver	11.5611	9.1821	79.46	0.1621	1.43	0.0128	0.12	0.2689	2.31	0.7230	6.20	0.6022	5.24	0.0184	0.16
	Riz glacé	1 & 2	11.2546	8.8938	79.02	0.1695	1.51	0.0184	0.16	0.2898	2.57	0.6710	5.96	0.6022	5.35	0.0184	0.16
	Polished rice	Juin-June	11.0849	7.9600	71.81	0.1338	1.21	0.0128	0.12	0.2462	2.22	0.7088	6.39	0.6082	5.48	0.0125	0.11
		Moy-Aver	11.1698	8.4269	75.42	0.1517	1.36	00.156	0.14	0.2680	2.40	0.6899	6.18	0.6052	5.42	0.0155	0.14
Tanaka	Riz glacé	28 & 29	8.2460	6.4796	78.81	0.1327	1.67	0.0240	0.29	0.1609	1.95	0.5670	6.63	0.5762	6.98	0.0259	0.31
	Polished rice	Mai-May	10.2517	7.7021	75.13	0.1768	1.73	0.0156	0.15	0.2118	2.07	0.5670	5.53	0.5846	5.70	0.0298	0.29
		Moy-Aver	9.2489	7.0909	76.97	0.1548	1.70	0.0198	0.22	0.1864	2.01	0.5670	6.08	0.5804	6.34	0.0279	0.30
	Riz mi-glacé	30	10.4189	7.9016	75.80	0.1940	1.86	0.0142	0.13	0.2612	2.51	0.6521	6.26	0.5903	5.66	0.0370	0.35
	Half-pol. rice	31	9.5860	7.8978	82.38	0.1254	1.31	0.0114	0.12	0.2716	2.83	0.6143	6.41	0.5576	5.40	0.0507	0.53
		Moy-Aver	10.0025	7.8997	79.09	0.1597	1.59	0.0128	0.13	0.2664	2.67	0.6332	6.34	0.5740	5.53	0.0439	0.44
	Riz glacé	1 & 2	9.6946	7.7459	79.99	0.1278	1.32	0.0184	0.19	0.2418	2.50	0.6332	6.53	0.5680	5.86	0.0658	0.68
	Polished rice	Juin-June	9.3046	6.9315	74.39	0.1033	1.11	0.0156	0.17	0.2314	2.49	0.5670	6.09	0.5628	6.04	0.0711	0.76
		Moy-Aver	9.4996	7.3432	77.19	0.1156	1.22	0.0170	0.18	0.2368	2.50	0.6001	6.31	0.5654	5.95	0.0685	0.72

The Daily Output of SO_3, P_2O_5, and NaCl in the Urine.

Période Period	Date	Hara			Higuchi		
		SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_3(g)	Na
Riz glacé Polished rice	Mai-May 28	1.8544	1.2245	15.438	1.7460	1.1837	1
	29	1.5808	1.6377	16.830	1.4957	1.5102	1
	Moyenne –Aver.	1.7176	1.4311	16.134	1.6209	1.3470	1
Riz mi-glacé Half-pol. rice	30	1.6439	1.7959	26.610	1.7234	1.8776	2
	31	1.6157	1.5918	22.770	1.6638	1.7551	2
	Moyenne –Aver.	1.6298	1.6939	24.690	1.6936	1.8164	2
Riz glacé Polished rice	Juin-June 1	1.6610	1.4286	26.037	1.6528	1.5918	2
	2	1.7762	1.3673	24.750	1.8105	1.6122	2
	Moyenne –Aver.	1.7186	1.3980	25.394	1.7317	1.6020	2

Période Period	Date	Momoyeda			Sugisaki			Tanaka	
		SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)
Riz glacé Polished rice	Mai-May 28	—	—	—	2.1328	1.3877	17.600	1.6860	0.8775
	29	1.7328	1.5306	16.830	1.8736	1.9388	19.305	1.7659	1.7959
	Moyenne –Aver.	1.7328	1.5306	16.830	2.0032	1.6633	18.463	1.7260	1.3367
Riz mi-glacé Half-pol. rice	30	1.6754	1.8571	24.057	1.9538	1.7551	22.572	1.7652	1.9388
	31	1.6473	1.3877	23.661	1.9854	1.9796	26.431	1.7344	1.8367
	Moyenne –Aver.	1.6614	1.6224	23.859	1.9696	1.8674	24.502	1.7498	1.8878
Riz glacé Polished rice	Juin-June 1	1.5342	1.2245	23.245	1.9477	2.2714	25.867	1.7550	1.6938
	2	1.8846	1.0205	24.552	1.9861	1.7551	25.344	1.7412	1.4490
	Moyenne –Aver.	1.7094	1.1225	23.899	1.9669	2.0135	25.606	1.7486	1.5719

Sujets / Subject	Période / Period	Absorption d'azote Moyenne journalière — N. intake Average per day: Azote (gr.) Nitrogen (gms.)	Protéïne (gr.) Protein (gms.)	Azote trouvé dans l'urine Moyenne journalière — N. in urine Average per day: Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Azote trouvé dans les selles Moyenne journalière — N. in fæces Average per day: Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Gains ou pertes en azote Nitrogen balance	Absorption Moyenne journalière — Absorption Average per day: Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Calories	Pourcentage d'absorption % of absorption
Hara . . .	Riz glacé / Polished rice	13.2525	82.8282	8.8032	67.18	1.9213	14 49	+ 2.5280	11.3312	73.3390	290.362	85.51
	Riz mi-glacé / Half-pol. rice	14.0025	87.5157	9.5016	67 85	2.2681	16.19	+ 2.2328	11.7344	73.3390	300.690	83.81
	Riz glacé / Polished rice	13.2525	82.8282	9.6111	72 53	1.5942	12.03	+ 2.0472	11.6583	72.8644	298.740	87.97
Higuchi . .	*Idem*	13.0497	81.5607	8.6081	65.81	2.4735	18.95	+ 1.9681	10.5762	66.1013	271.015	81.05
		14.0025	87.5157	10.1975	72.82	2.7893	19.92	+ 1.0157	11.2132	69.1824	283.688	80.08
		13.2525	82.8282	9.9160	74.82	1.9611	14.79	+ 1.3754	11.2914	70.5614	289.302	85.21
Momoyeda	*Idem*	13.2525	82.8282	10.6003	79.98	1.8177	13.71	+ 0.8345	11.4348	71.4665	293.013	86.29
		14.4971	90.6069	10.0587	69.38	2.5531	17.61	+ 1.8853	11.9440	74.6400	306.024	82.39
		13.2525	82.8282	9.8916	74.64	1.3917	10.50	+ 1.9692	11.8608	74.1300	303.933	89.50
Sugisaki . .	*Idem*	13.2525	82.8282	11.5332	87.02	1.8141	13.68	— 0.0948	11.4384	71.4900	293.109	86.32
		13.7552	85.9700	11.5611	83.32	2.3679	17.21	— 0.1738	11.9411	74.6319	305.991	82.79
		13.2525	82.8282	11.1698	84.28	1.5865	11.97	+ 0.4862	11.6660	72.9125	298.941	88.03
Tanaka . .	*Idem*	12.4411	77.7569	9.2489	74.34	1.3034	10.48	+ 1.8888	11.1377	69.6106	285.403	89.52
		13.5079	84.4244	10.0025	74.05	2.5306	18.73	+ 0.9748	10.9773	68.6081	281.293	81.27
		12.4411	77.7569	9.4996	76.36	1.8605	14.95	+ 1.0810	10.5806	66.1288	271.128	85.05

Digestibility and Utilisation of the Carbohydrate (as Glucose) and its Caloric Value.

Sujets Subject	Période Period	Absorption des hydrates de carbone Moy. jour. (gr.) Carbohydrate intake Average per day (gms.)	Hydrates de carb. élim. dans les selles Moyenne journal. Carbohydrate in fæces Average per day Quantité (gr.) Quantity (gms.)	 % de la quantité absorbée % against intake	Absorption Moyenne journalière Absorption Average per day Quantité (gr.) Quantity (gms.)	 Calories	Pourcentag d'absorptio % of absorptio
Hara . .	Riz glacé Polished rice	520.37	1.6843	0.32	518.69	2126.629	99.68
	Riz mi-glacé Half-pol. rice	416.46	2.5833	0.62	413.88	1696.908	99.38
	Riz glacé Polished rice	520.37	1.5055	0.29	518.86	2127.326	99.71
Higuchi .	*Idem*	504.64	2.0635	0.41	502.58	2060.578	99.5
		416.46	3.6910	0.87	412.77	1692.357	99.1
		520.37	1.5577	0.29	518.81	2127.121	99.7
Momoyeda	*Idem*	520.37	1.3557	0.26	519.01	2127.941	99.7
		442.25	2.5117	0.57	439.74	1802.934	99.4
		520.37	1.2724	0.24	519.10	2128.310	99.7
Sugisaki .	*Idem*	520.37	1.4882	0.28	518.88	2127.408	99.7
		403.57	2.3491	0.58	401.22	1645.002	99.4
		520.37	1.6347	0.31	518.74	2126.834	99.6
Tanaka .	*Idem*	457.63	0.9026	0.19	456.73	1872.593	99.8
		490.67	2.4487	0.62	388.22	1591.702	99.3
		457.63	1.6515	0.36	455.98	1869.518	99.6

Digestibility and Utilisation of Crude Fat.

Sujets Subject	Période Period	Absorption de la graisse Moy. jour. (gr.) Fat intake Average per day (gms.)	Graisse éliminée dans les selles Moyenne journal. Fat in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
Hara . .	Riz glacé Polished rice	16.38	1.6383	10.00	14.74	137.082	90.00
	Riz mi-glacé Half-pol. rice	20.62	4.8030	23.29	15.82	147.126	76.71
	Riz glacé Polished rice	16.38	1.7120	10.45	14.67	136.431	89.55
Higuchi .	*Idem*	16.29	2.4817	15.23	13.81	128.433	84.77
		20.62	4.3458	21.07	16.27	151.311	78.93
		16.38	1.6844	10.28	14.70	136.710	89.72
Momoyeda	*Idem*	16.38	1.7863	10.90	14.59	135.687	89.10
		21.14	4.7179	22.31	16.42	152.706	77.69
		16.38	2.0327	12.41	14.35	133.455	87.59
Sugisaki .	*Idem*	16.38	1.3459	8.21	15.03	139.779	91.79
		20.36	4.3758	21.49	15.98	148.614	78.51
		16.38	1.8758	11.45	14.50	134.850	88.55
Tanaka .	*Idem*	16.02	1.2672	7.91	14.76	137.268	92.00
		20.10	4.5799	22.78	15.52	144.336	77.22
		16.02	1.7438	10.88	14.28	132.804	89.12

Digestibility and Utilisation of Crude Ash.

Sujets Subject	Période Period	Absorption des cendres Moy. journ. (gr.) Ash intake Average per day (gms.)	Cendres éliminées dans les selles Moyenne journalière Ash in fæces Average per day Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Pourcentage d'absorption % of absorption
Hara . . .	Riz glacé	30.73	2.2471	7.32	92.68
	Polished rice				
	Riz mi-glacé	31.13	4.0905	13.14	86.86
	Half-polished rice . .				
	Riz glacé	30.73	2.2751	7.40	92.60
	Polished rice				
Higuchi .	*Idem*	30.67	2.9533	9.62	90.38
		31.13	4.3637	14.01	85.99
		30.73	2.8881	9.40	90.60
Momoyeda	*Idem*	30.73	2.3464	7.63	92.37
		31.29	3.5647	11.39	88.61
		30.73	2.4659	8.02	91.98
Sugisaki .	*Idem*	30.73	2.8230	9.12	90.88
		31.05	4.7050	11.15	84.85
		30.73	2.9829	9.70	90.30
Tanaka . .	*Idem*	30.49	1.9803	6.49	93.51
		30.97	5.2533	16.96	83.04
		30.49	3.0542	10.02	89.98

Percentage of the Caloric Value of Food actually utilised by the Body.

Sujets Subject	Période Period	Absorption des calories Moyenne journalière Calories intake Average per day		Utilisation des calories Caloric utilisation		% de la quantité de calories absorbée % against calories intake
		Calories totales Total calories	Par kg. du poids Per kg. of body weight	Calories totales Total calories	Par kg. du poids Per kg. of body weight	
ara . .	Riz glacé	2625.446	47.62	2554.073	46.33	97.24
	Polished rice . .					
	Riz mi-glacé . .	2258.066	40.94	2144.724	38.89	94.98
	Half-pol. rice . .					
	Riz glacé. . . .	2625.446	47.56	2562.497	46.33	97.60
	Polished rice . .					
iguchi .	*Idem*	2555.124	48.57	2460.026	46.77	96.28
		2258.066	42.69	2127.356	40.21	94.21
		2625.446	49.91	2553.133	48.54	97.25
omoyeda	*Idem*	2625.446	45.27	2556.641	44.08	97.38
		2381.315	41.02	2261.664	38.96	94.98
		2625.446	45.20	2565.698	42.45	97.72
gisaki .	*Idem*	2625.446	48.53	2560.296	47.33	97.52
		2196.461	40.71	2099.607	38.92	95.59
		2625.446	49.07	2560.625	47.86	97.53
naka .	*Idem*	2349.072	44.71	2295.264	43.53	97.71
		2134.816	40.49	2017.331	38.26	94.50
		2349.072	44.57	2273.450	43.14	96.78

II. *Comparison of Polished Rice with 50%-polished Rice.*

The percentages of digestibility and utilised calories were as follows:

	Total Nitrogen	Carbo-hydrate	Crude fat	Crude ash	Calories
paratory period . .	85.738	99.708	89.550	91.954	97.226
lf-polished rice period	82.064	99.348	77.812	85.870	94.852
ished rice period . .	87.132	99.702	88.906	91.092	97.376

The absolute digestibility of each constituent of the rice and the absolu output of each in the fæces have been calculated as in the previous experiment. T results are as shown in the following table:

		Riz glacé cuit Boiled polished rice	Riz mi-glacé cuit Boiled half-polished ric
Quantité fournie par 100 gr. de riz non glacé Amount obtained from 100 gms. of unpolished rice.		228.16	272.16
Azote total Total nitrogen	Pourcentage — Percentage . . .	0.4057	0.4946
	Quantité — Amount	0.9256	1.3641
	Pourcentage de digestibilité . . . . % of digestibility	87.132	82.061
	Quantité totale utilisé . . . . . . Total amount utilised	0.8065	1.1046
	Total trouvé dans les selles . . . . Total in the fæces	0.1191	0.2415
Hydrates de carbone Carbo-hydrate	*Idem*	31.37 71.57 99.702 71.36 0.21	25.79 60.19 99.348 59.80 0.39
Graisse brute Crude fat	*Idem*	0.18 0.41 88.906 0.36 0.05	0.52 1.41 77.812 1.10 0.31
Cendres brutes Crude ash	*Idem*	0.12 0.27 91.092 0.25 0.02	0.16 0.44 85.870 0.38 0.06

Experiment III.

THE COMPARISON OF THE DIGESTIBILITY OF UNPOLISHED RICE AND POLISHED R

In this experiment, four men were used as subjects and the following re were obtained:

Sujets Subjects	Période Period	Date	Azote total Total N. (g)	Azote de l'urée Urea N.		Azote de NH^3 Ammonia N.		Azote de l'acide urique Uric acid N.		Azote des bases puriques Purin base N.		Azote des acides aminés Amino acid N.		Azote de la créatinine Creatinin N.		Azote de la créatine Creatin N.	
				(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
Higuchi		Juin-June															
	Riz glacé	14	10.3075	8.2603	80.14	0.1678	1.66	0.0142	0.14	0.2659	2.58	0.5670	5.50	0.5680	5.51	0.0109	0.10
	Polished rice	15	10.3636	7.9825	77.02	0.1156	1.12	0.0170	0.16	0.2417	2.34	0.8505	8.21	0.5903	5.70	0.0116	0.11
		Moy-Aver	10.3356	8.1214	78.58	0.1417	1.39	0.0156	0.15	0.2538	2.46	0.7088	6.86	0.5792	5.61	0.0113	0.11
	Riz non glacé	16	10.3075	8.5533	82.98	0.1866	1.82	0.0114	0.11	0.2569	2.49	0.6521	6.33	0.5762	5.59	0.0141	0.13
	Unpol. rice	17	10.6975	8.6301	80.67	0.1744	1.63	0.0142	0.13	0.2531	2.37	0.8033	7.51	0.5846	5.46	0.0175	0.16
		Moy-Aver	10.5025	8.5917	81.83	0.1805	1.73	0.0128	0.12	0.2550	2.43	0.7277	6.92	0.5804	5.53	0.0158	0.15
	Riz glacé	18	10.3075	8.2754	80.28	0.1156	1.12	0.0147	0.14	0.2657	2.57	0.8355	8.11	0.5735	5.56	0.0169	0.16
	Polished rice	19	9.4160	7.4340	78.95	0.1401	1.49	0.0119	0.12	0.1931	2.05	0.7889	9.33	0.6051	6.42	0.0093	0.10
		Moy-Aver	9.8618	7.8547	79.62	0.1279	1.31	0.0133	0.13	0.2294	2.31	0.8572	8.72	0.5893	5.99	0.0131	0.13
Momoyeda	Riz glacé	14	8.6360	6.6567	77.08	0.1524	1.61	0.0240	0.28	0.2133	2.47	0.7749	8.97	0.6338	7.34	0.0137	0.16
	Polished rice	15	9.9732	7.4430	74.63	0.1776	1.78	0.0198	0.20	0.2501	2.51	0.7839	7.86	0.6406	6.42	0.0136	0.14
		Moy-Aver	9.3046	8.0499	75.86	0.1650	1.70	0.0219	0.24	0.2317	2.24	0.7794	8.42	0.6372	6.88	0.0137	0.15
	Riz non glacé	16	9.7503	8.0722	82.69	0.1425	1.46	0.0140	0.14	0.1913	1.96	0.6521	6.68	0.6273	6.43	0.0133	0.13
	Unpol. rice	17	10.0846	7.5009	74.38	0.1229	1.22	0.0212	0.21	0.1537	1.53	0.8789	8.72	0.6338	6.28	0.0204	0.20
		Moy-Aver	9.9175	7.7866	78.54	0.1327	1.34	0.0176	0.18	0.1725	1.75	0.7655	7.70	0.6306	6.36	0.0169	0.17
	Riz glacé	18	10.5860	7.2865	68.83	0.2038	1.93	0.0184	0.17	0.2433	2.30	0.4819	4.55	0.6475	6.11	0.0142	0.13
	Polished rice	19	10.8089	7.2904	67.45	0.1903	1.76	0.0142	0.13	0.2481	2.30	0.8883	8.24	0.6475	5.99	0.0216	0.20
		Moy-Aver	10.6975	7.2885	68.14	0.1971	1.90	0.0163	0.15	0.2457	2.30	0.6851	6.40	0.6475	6.05	0.0179	0.17

(Continued.)

Subjects Sujets	Période Period	Date	Azote total Total N. (g)	Azote de l'urée Urea N. (g)	(%)	Azote de NH^3 Ammonia N. (g)	(%)	Azote de l'acide urique Uric acid N. (g)	(%)	Azote des bases puriques Purin base N. (g)	(%)	Azote des acides aminés Amino acid N. (g)	(%)	Azote de la créatinine Creatinin N. (g)	(%)	Azote de la créatine Creatin N. (g)	(%)
Sugisaki	Riz glacé Polished rice	Juin-June 14	9.3075	7.3666	79.15	0.0617	0.66	0.0156	0.17	0.2243	2.41	0.7938	8.53	0.6022	6.47	0.0123	0.13
		15	9.6418	7.2866	75.57	0.1511	1.57	0.0101	0.10	0.1733	1.79	0.9072	9.41	0.6144	6.37	0.0129	0.13
		Moy-Aver	9.4747	7.3266	77.36	0.1064	1.12	0.0129	0.14	0.1988	2.10	0.8505	8.97	0.6083	6.42	0.0126	0.13
	Riz non glacé Unpol. rice	16	9.1014	7.2758	79.94	0.1588	1.74	0.0114	0.13	0.1776	1.45	0.7088	7.78	0.6022	6.61	0.0123	0.13
		17	10.0289	8.3458	83.32	0.1597	1.59	0.0142	0.14	0.2327	2.32	0.6899	6.88	0.6082	6.06	0.0190	0.19
		Moy-Aver	9.5652	7.8108	81.63	0.1593	1.62	0.0128	0.14	0.2052	2.14	0.6994	7.33	0.6052	6.34	0.0157	0.16
	Riz glacé Polished rice	18	9.7403	7.9661	81.78	0.1329	1.36	0.0142	0.15	0.2561	2.68	0.6332	6.50	0.6176	6.34	0.0160	0.16
		19	8.9743	6.9078	76.85	0.1535	1.71	0.0095	0.10	0.2382	2.66	0.8411	9.37	0.5903	6.58	0.0116	0.13
		Moy-Aver	9.3673	7.4370	79.32	0.1432	1.54	0.0119	0.13	0.2472	2.67	0.7372	7.94	0.6040	6.46	0.0138	0.15
Tanaka	Riz glacé Polished rice	14	10.5303	7.6927	73.05	0.1131	1.07	0.0170	0.16	0.2556	2.43	0.5426	5.15	0.5735	5.44	0.0741	0.70
		15	10.1960	8.0129	78.59	0.1229	1.21	0.0170	0.17	0.2012	1.97	0.5670	5.56	0.4576	4.48	0.0899	0.88
		Moy-Aver	10.3632	7.8528	75.82	0.1180	1.14	0.0170	0.17	0.2284	2.20	0.5548	5.36	0.5156	4.96	0.0820	0.79
	Riz non glacé Unpol. rice	16	10.8646	9.0338	83.15	0.1793	1.65	0.0142	0.13	0.1568	1.91	0.5481	5.04	0.5790	5.33	0.1052	0.97
		17	10.8646	8.6468	79.49	0.1229	1.13	0.0198	0.18	0.2389	2.20	0.7088	6.52	0.5903	5 43	0.0862	0.79
		Moy-Aver	10.8646	8.8403	81.32	0.1511	1.39	0.0170	0.16	0.1979	2.06	0.6285	5.78	0.5847	5.38	0.0957	0.88
	Riz glacé Polished rice	18	10.8646	8.3161	76.54	0.1927	1.77	0.0101	0.09	0.2457	2.26	0.5670	5.22	0.5903	5.33	0.0639	0.58
		19	10.0846	8.0491	79.82	0.1087	1.07	0.0128	0.13	0.1646	1.63	0.6048	6.00	0.5580	5.53	0.1011	1.00
		Polished rice															

The Daily Output of SO_3, P_2O_5, and NaCl in the Urine.

ériode eriod	Date	Higuchi			Momoyeda		
		SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	NaCl(g)
	Juin-June						
	14	1.7872	1.6531	25.265	1.4594	1.3265	22.770
acé	15	1.7900	1.3673	25.661	1.6775	1.3469	25.661
ied rice	Moyenne						
	— Aver.	1.7886	1.5102	25.463	1.5685	1.3367	24.216
	16	1.7200	1.7959	21.186	1.6651	1.5306	22.572
on glacé	17	1.7858	1.6531	24.948	1.8268	1.4081	27.522
l. rice	Moyenne						
	— Aver.	1.7529	1.7245	23.067	1.7460	1.4694	25.047
	18	1.6864	1.4490	20.889	2.0718	1.7959	21.580
acé	19	1.7460	1.3877	26.235	1.8482	1.6122	23.760
ed rice	Moyenne						
	— Aver.	1.7162	1.4184	23.562	1.9600	1.7041	22.670

iode riod	Date	Sugisaki			Tanaka		
		SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	NaCl(g)
	Juin-June						
	14	1.7623	1.4081	24.750	1.9724	1.3877	26.431
ıcé	15	1.8414	1.6735	25.265	1.8640	1.6377	20.291
ed rice	Moyenne						
	— Aver.	1.8019	1.5408	25.008	1.9182	1.5127	23.361
	16	1.7174	1.6377	22.077	1.9916	1.8571	24.552
n glacé	17	1.9257	1.6122	24.750	2.0485	1.7341	24.869
rice	Moyenne						
	— Aver.	1.8366	1.6250	23.414	2.0201	1.7959	24.711
	18	1.7570	1.5306	23.463	1.9223	1.6377	20.790
cé	19	1.7035	1.5510	24.354	1.8681	1.6122	21.780
d rice	Moyenne						
	— Aver.	1.7303	1.5408	23.909	1.8952	1.6250	21.290

Nitrogen Balance: the Digestibility and Utilisation, and Caloric Value.

Sujets Subject	Période Period	Absorption d'azote Moyenne journalière N. intake Average per day		Azote trouvé dans l'urine Moyenne journalière N. in urine Average per day		Azote trouvé dans les selles Moyenne journalière N. in fæces Average per day		Gains ou pertes en azote Nitrogen balance	Absorption Moyenne journalière Absorption Average per day			Pourcentage d'absorption % of absorption
		Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake		Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Calories	
Higuchi . .	Riz glacé Polished rice	12.4411	77.7569	10.3356	83.07	2.2798	18.32	— 0.1743	10.1613	63.5081	260.383	81.68
	Riz non glacé Unpolished rice	12.2896	76.8100	10.5025	85.45	2.9415	24.02	— 1.1544	9.3481	58.4256	239 545	75.98
	Riz glacé Polished rice	12.4411	77.7569	9.8618	79.27	1.9756	15.88	+ 0.6037	10.4655	65.4094	268.179	84.12
Momoyeda	*Idem*	12.2383	76.4894	9.3046	76.03	2.0395	16.66	+ 0.8942	10.1988	63.7425	261.344	83.34
		13.0758	81.7238	9.9175	75.84	3.0728	23.50	+ 0.0855	10.0030	62.5188	256.327	76.50
		13.0497	81.5607	10.6975	81.98	2.0232	15.50	+ 0.3290	11.0265	68.9156	282.554	84.50
Sugisaki . .	*Idem*	12.4411	77.7569	9.4747	76.15	2.2535	18.11	+ 0.7129	10.1876	63.6725	261.057	81.89
		12.2896	76.8100	9.5652	77.83	2.3813	19.37	+ 0.3431	9.9083	61.9269	253.900	80.63
		12.6440	79.0250	9.3673	74.08	1.3612	10.76	+ 0.9181	11.2828	70.5175	289.122	89.24
Tanaka . .	*Idem*	12.4411	77.7569	10.3632	83.29	1.6555	13.31	+ 0.4224	10.7856	67.4100	276.381	86.69
		11.7655	73.5344	10.8646	92.35	2.5947	22.05	— 1.6938	9.1708	51.3175	210.402	77.95
		12.0454	75.2213	10.4746	86.96	2.1956	18.23	— 0.6248	9.8498	61.5613	252.401	81.77

Digestibility and Utilisation of the Carbohydrate (as Glucose) and its Caloric Value.

Sujets / Subject	Période / Period	Absorption des hydrates de carbone Moy. jour. (gr.) Carbohydrate intake Average per day (gms.)	Hydrates de carb. élim. dans les selles Moyenne journal. Carbohydrate in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
Higuchi .	Riz glacé Polished rice	457.63	1.8286	0.39	455.80	1868.780	99.61
	Riz non glacé Unpolished rice	268.75	4.4427	1.65	264.31	1043.671	98.35
	Riz glacé Polished rice	457.63	1.4371	0.31	456.19	1870.379	99.69
Momoyeda	*Idem*	441.95	1.5982	0.36	440.35	1805.435	99.64
		300.01	3.8228	1.27	296.19	1214.379	98.73
		504.64	1.9615	0.38	502.68	2060.988	99.62
Sugisaki .	*Idem*	457.63	1.8063	0.39	455.82	1868.862	99.61
		268.75	2.4370	0.91	266.31	1091.871	99.09
		473.32	1.3304	0.28	471.99	1935.159	99.72
Tanaka .	*Idem*	457.63	1.4958	0.33	456.13	1870.133	99.67
		247.91	3.0568	1.23	244.85	1003.885	98.77
		426.26	1.4208	0.34	424.84	1741.844	99.66

Digestibility and Utilisation of Crude Fat and its Caloric Value.

Sujets Subject	Période Period	Absorption de la graisse Moy. jour. (gr.) Fat intake Average per day (gms.)	Graisse éliminée dans les selles Moyenne journal. Fat in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pourcentag d'absorptio % of absorptio
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
Higuchi .	Riz glacé Polished rice	16.02	1.5811	9.87	14.44	134.292	90.1
	Riz non glacé Unpolished rice	21.24	7.6276	35.91	13.61	126.573	64.0
	Riz glacé Polished rice	16.02	2.1050	13.14	13.91	129.363	86.8
Momoyeda	*Idem*	15.93	1.8719	11.75	14.06	130.758	88.2
		22.47	8.9728	39.93	13.51	125.643	60.0
		16.29	3.1855	19.55	13.10	121.830	80.4
Sugisaki .	*Idem*	16.02	2.2036	13.75	13.82	128.526	86.2
		21.24	6.2441	29.40	15.00	139.500	70.6
		16.11	1.8708	11.61	14.24	132.432	88.3
Tanaka .	*Idem*	16.02	1.4912	9.33	14.53	135.129	90.6
		20.42	8.4215	41.42	12.00	111.600	58.7
		15.84	1.9851	12.53	13.85	128.805	87.4

Digestibility and Utilisation of Crude Ash.

Sujets Subject	Période Period	Absorption des cendres Moy. journ. (gr.) Ash intake Average per day (gms.)	Cendres éliminées dans les selles Moyenne journalière Ash in fæces Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	
Higuchi .	Riz glacé	30.49	2.9090	9.54	90.45
	Polished rice				
	Riz non glacé	32.11	6.9590	21.67	78.33
	Unpolished rice . . .				
	Riz glacé	30.49	2.4626	8.08	91.92
	Polished rice				
Momoyeda	*Idem*	30.43	2.1992	7.23	92.77
		32.62	6.2698	19.22	80.78
		30.67	2.9560	9.64	90.36
Sugisaki .	*Idem*	30.49	2.7745	9.10	90.90
		32.11	5.1327	16.00	84.00
		30.55	2.5644	8.40	91.60
Tanaka .	*Idem*	30.49	2.4897	8.16	91.84
		31.77	7.3193	23.04	76.96
		30.37	2.8091	9.25	90.75

The Percentage of the Caloric Value of Food actually utilised by the Body.

Sujets Subject	Période Period	Absorption des calories Moyenne journalière Calories intake Average per day		Utilisation des calories Caloric utilisation		% de la quantité de calories absorbée
		Calories totales Total calories	Par kg. du poids Per kg. of body weight	Calories totales Total calories	Par kg. du poids Per kg. of body weight	% against calories intake
Higuchi .	Riz glacé . . . Polished rice . .	2349.072	44.96	2263.455	43.32	96.35
	Riz non glacé . . Unpolished rice .	1614.327	30.89	1409.789	26.98	87.34
	Riz glacé . . . Polished rice . .	2349.072	44.66	2267.921	43.11	96.53
Momoyeda	*Idem*	2273.564	39.47	2197.537	38.11	96.55
		1774.079	30.77	1596.349	27.70	90.02
		2555.124	44.44	2465.372	42.87	96.47
Sugisaki .	*Idem*	2349.072	44.03	2258.445	42.33	96.14
		1614.327	30.46	1485.271	28.02	91.99
		2414.437	45.55	2356.713	44.47	97.62
Tanaka .	*Idem*	2349.072	44.68	2281.643	43.39	97.11
		1507.828	28.65	1325.887	25.36	88.52
		2202.920	42.18	2123.050	40.65	96.37

III. *Comparison of Polished Rice with Unpolished Rice.*

The percentages of digestibility and utilised calories were as follows:

	Total Nitrogen	Carbo-hydrate	Crude fat	Crude ash	Calories
Preparatory period . .	83.400	99.633	88.825	91.490	96.538
Unpolished rice period .	77.765	98.735	63.380	80.018	89.468
Polished rice period . .	84.908	99.673	85.793	91.158	96.748

The absolute digestible quantity of each constituent of the rice and the absolute utput of each in the fæces have been calculated; the results are shown in the ollowing table:

		Riz glacé cuit Boiled polished rice	Riz non glacé cuit Boiled unpolished rice
Quantité fournie par 100 gr. de riz non glacé . . Amount obtained from 100 gms. of unpolished rice.		228.16	263.86
Azote total Total nitrogen	Pourcentage — Percentage . . .	0.4057	0.5241
	Quantité — Amount	0.9256	1.3829
	Pourcentage de digestibilité . . . . % of digestibility	84.908	77.765
	Quantité totale utilisée . . . . . . Total amount utilised	0.7859	1.0754
	Total trouvé dans les selles . . . . Total in the fæces	0.1397	0.3075
Hydrates de carbone Carbo-hydrate	*Idem*	31.37 71.57 99.673 71.34 0.23	20.84 54.99 98.735 54.29 0.70
Graisse brute Crude fat	*Idem*	0.18 0.41 85.793 0.35 0.06	0.82 2.16 63.380 1.37 0.79
Cendres brutes Crude ash	*Idem*	0.12 0.27 91.158 0.25 0.02	0.34 0.90 80.018 0.72 0.18

Experiment IV.

The Comparison of the Digestibility of Half-polished Rice and 70%-polished Rice.

In this experiment, five men were used as subjects and the following results ere obtained.

Daily Output of the Total Nitrogen and the Distribution of Nitrogenous Constituents in the Urine.

Sujets Subjects	Période Period	Date	Azote total Total N. (g)	Azote de l'urée Urea N.		Azote de NH^3 Ammonia N.		Azote de l'acide urique Uric acid N.		Azote des bases puriques Purin base N.		Azote des acides aminés Amino acid N.		Azote de la créatinine Creatinin N.		Azote de la créatine Creatin N.	
				(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
Sugimoto	Riz glacé	Sept. 29	10.0232	8.0614	80.43	0.1255	1.25	0.0201	0.20	0.2398	2.39	0.6774	6.16	0.5282	5.29	0.0143	0.14
	à 70 %	30	9.3800	7.2903	77.83	0.1574	1.68	0.0268	0.29	0.1655	1.77	0.5974	6.37	0.5282	5.63	0.0193	0.21
	70% pol. rice	Moy-Aver	9.7016	7.6759	79.13	0.1415	1.47	0.0235	0.25	0.2027	2.08	0.6374	6.27	0.5282	5.46	0.0168	0.18
	Riz mi-glacé	Oct. 1	10.0232	8.0485	80.30	0.1795	1.79	0.0215	0.21	0.2703	2.69	0.6546	6.53	0.5484	5.47	0.0315	0.31
	Half-pol. rice	2	9.7016	7.8667	81.07	0.1451	1.50	0.0268	0.28	0.1377	1.42	0.5746	5.92	0.5484	5.65	0.0260	0.27
		Moy-Aver	9.8624	7.9576	80.69	0.1623	1.65	0.0242	0.25	0.2040	2.06	0.6146	6.23	0.5484	5.56	0.0288	0.29
	Riz glacé	Oct. 3	9.8088	7.6382	77.87	0.1574	1.60	0.0174	0.17	0.1014	1.04	0.6888	7.02	0.5376	5.48	0.0148	0.11
	à 70 %	4	9.7552	7.6238	78.15	0.1525	1.56	0.0188	0.12	0.1027	1.05	0.6203	6.36	0.5524	5.87	0 0103	0.11
	70% pol. rice	Moy-Aver	9.7820	7.6310	78.01	0.1550	1.58	0.0181	0.15	0.1021	1.05	0.6546	6.69	0.5450	5.63	0.0126	0.11
Inoue	Riz glacé	Sept. 29	8.2544	6.7592	81.89	0.2187	2.65	0.0282	0.34	0.1211	1.47	0.8031	9.73	0.5484	6.64	0.0101	0.12
	à 70 %	30	9.5944	7.6372	79.60	0.2678	2.79	0.0228	0.24	0.1423	1.48	0.7217	7.52	0.5376	5.60	0.0148	0.15
	70% pol. rice	Moy-Aver	8.9244	7.1982	80.75	0.2433	2.72	0.0255	0.27	0.1317	1.48	0.7624	8.63	0.5430	6.12	0.0125	0.14
	Riz mi-glacé	Oct. 1	9.4330	7.6078	80.65	0.1353	1.43	0.0228	0.23	0.2070	2.20	0.7802	8.27	0.5103	5.40	0.0179	0.19
	Half-pol. rice	2	8.9512	6.9726	77 90	0.2187	2.44	0.0225	0.25	0.1550	1.73	0.7459	8.33	0.4976	5.56	0.0126	0.14
		Moy-Aver	9.1921	7.2902	79.28	0.1770	1.94	0.0227	0.24	0.1810	1.97	0.7631	8.30	0.5040	5.48	0.0153	0.17
	Riz glacé	Oct. 3	9.4330	7.4739	79.23	0.1663	1.66	0.0215	0.23	0.1240	1.32	0.8716	9.25	0.5103	5.41	0.0133	0.14
	à 70 %	4	8.5760	6.9076	80.55	0.1942	2 27	0.0174	0.20	0.0959	1.12	0.7231	8.43	0.5103	5.94	0.0133	0.16
	70% pol. rice	Moy-Aver	9.0045	7.1908	79.89	0.1803	1.97	0.0195	0.22	0.1100	1.22	0.7974	8.84	0.5103	5.68	0.0133	0.15
Ishibashi	Riz glacé	Sept. 29	7.9824	6.5191	81.67	0.1672	2.10	0.0242	0.30	0.1165	1.46	0.8487	10.63	0.4895	6.13	0.0081	0.10
	à 70 %	30	9.3800	7.4274	79.18	0.2506	2.67	0.0255	0.27	0.1217	1.30	0.9173	9.78	0.4817	5.14	0.0117	0.12
	70% pol. rice	Moy-Aver	8.6812	6.9733	80.43	0.2039	2.39	0.0249	0.29	0.1191	1.88	0.8830	10.21	0.4856	5.64	0.0099	0.11
	Riz mi glacé	Oct. 1	8.4152	6.6753	79.32	0.2392	2.84	0.0215	0.26	0.1424	1.69	0.9401	11.17	0.4364	5.19	0.0097	0.12
	Half-pol. rice	2	9.3800	7.0504	75.27	0.2408	2.57	0.0268	0.29	0.1882	2.01	1.0772	11.48	0.4364	4.65	0.0130	0.14
		Moy-Aver															

Subjects Sujets	Période Period	Date	Azote total Total N.	Azote de l'urée Urea N.		Azote de NH^3 Ammonia N.		Azote de l'acide urique Uric acid N.		Azote des bases puriques Purin base N.		Azote des acides aminés Amino acid N.		Azote de la créatinine Creatinin N.		Azote de la créatine Creatin N.	
			(g)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
Ishibashi	Riz glacé	Oct. 3	9.6480	7.2986	75.65	0.1917	1.99	0.0228	0.24	0.1188	1.23	0.9858	10.22	0.4301	4.46	0.0159	0.16
	à 70 %	4	8.7368	7.0818	81.06	0.1966	2.25	0.0201	0.23	0.0982	1.13	0.8716	9.86	0.4562	5.23	0 0143	0.16
	70% pol. rice	Moy-Aver	9.1924	7.1902	78.36	0.1942	2.12	0.0215	0.24	0.1085	1.18	0.9287	10.04	0.4432	4.95	0.0151	0.16
Kayano	Riz glacé	Sept. 29	8.3080	7.3531	88.51	0.1991	2.40	0.0228	0.27	0.1462	1.76	0.4147	4.99	0.4395	5.29	0.0099	0.12
	à 70 %	30	8.4148	6.5249	77.54	0.1795	2.13	0.0242	0.29	0.1550	1.84	0.4489	5.33	0.4562	5.42	0.0071	0.08
	70% pol. rice	Moy-Aver	8.3614	6.9390	83.03	0.1893	2.27	0.0235	0.28	0.1506	1.80	0.4318	5.16	0.4479	5.36	0.0085	0.10
	Riz mi-glacé	Oct. 1	9.1120	7.4342	81.59	0.1279	1.40	0.0295	0.32	0.1952	2.14	0.6660	7.31	0.4240	4.66	0.0106	0.12
	Half-pol. rice	2	8.5224	7.3086	85.76	0.2138	2.51	0.0242	0.28	0.2161	2.56	0.6431	7.55	0.4211	4.94	0.0090	0.16
		Moy-Aver	8.8172	7.3714	83.68	0.1709	1.96	0.0269	0.30	0.2067	2.35	0.6546	7.43	0.4226	4.80	0.0098	0.14
Konoike	Riz glacé	Oct. 3	8.7368	7.0447	80.63	0.1991	2.28	0.0242	0.28	0.0522	0.60	0.7002	8.01	0.4364	4.99	0.0064	0.06
	à 70 %	4	8.6832	7.4517	85.82	0.1991	2.29	0.0134	0.15	0.1438	1.66	0.5517	6.35	0.4428	5.10	0.0066	0.08
	70% pol. rice	Moy-Aver	8.7100	7.2482	83.23	0.1991	2.29	0.0188	0.22	0.0979	1.13	0.6260	7.18	0.4396	5.05	0.0065	0.07
	Riz glacé	Sept. 29	10.0880	9.0939	90.15	0.2433	2.41	0.0279	0.28	0.2056	2.04	0.6089	6.04	0.4704	4.66	0.0113	0.11
	à 70 %	30	10.5056	8.8210	83.96	0.2285	2.18	0.0242	0.23	0.2382	2.27	0.7117	6.77	0.4779	4.55	0.0077	0.07
	70% pol. rice	Moy-Aver	10.2968	8.9575	87.06	0.2359	2.30	0.0261	0.26	0.2219	2.16	0.6603	6.41	0.4742	4.61	0.0095	0.15
	Riz mi-glacé	Oct. 1	9.2621	7.4329	80.25	0.1384	1.49	0.0188	0.29	0.1217	1.32	0.6895	7.44	0.4817	5.20	0.0065	0.07
	Half-pol. rice	2	10.2912	7.8729	76.50	0.2310	2.24	0.0255	0.25	0.1883	1.83	0.7117	6.91	0.4741	4.61	0.0114	0.11
		Moy-Aver	9.7767	7.6529	78.38	0.1847	1.87	0.0222	0.27	0.1550	1.58	0.7006	7.18	0.4779	4.91	0.0089	0.14
	Riz glacé	Oct. 3	8.9512	6.1085	68.24	0.1427	1.59	0.0201	0.22	0.0776	0.87	0.6797	7.59	0.4596	5.13	0.0072	0.08
	à 70 %	4	10.4520	8.8952	85.11	0.1893	1.81	0.0177	0.17	0.2510	2.40	0.3918	3.75	0.4428	4.24	0.0134	0.13
	70% pol. rice	Moy-Aver	9.7016	7.5019	76.67	0.1660	1.70	0.0189	0.20	0.1643	1.64	0.5358	5.67	0.4512	4.69	0.0103	0.11

The Daily Output of SO_3, P_2O_5, and NaCl in the Urine.

Période Period	Date	Sugimoto			Inoue			Ishibashi	
		SO_3 (g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)
Riz glacé à 70% 70% pol. rice	Sept. 29	1.7515	1.4890	21.492	1.7207	1.8367	19.502	1.5259	1.4286
	30	1.7899	1.6531	23.382	1.6871	2.2039	25.273	1.9154	1.6938
	Moyenne —Aver.	1.7707	1.5711	22.437	1.7039	2.0203	22.388	1.7207	1.5112
Riz mi-glacé Half-pol. rice	Oct. 1	1.9374	1.8776	23.581	1.7358	1.9592	23.382	1.6735	1.7551
	2	1.9504	1.7959	26.069	1.7179	1.8776	27.661	1.8730	1.7959
	Moyenne —Aver.	1.9467	1.8368	24.825	1.7269	1.9184	25.523	1.7733	1.7755
Riz glacé à 70% 70% pol. rice	Oct. 3	1.8311	1.6938	22.288	1.7735	1.8367	26.964	1.8292	1.6326
	4	1.8757	1.6734	17.333	1.7008	1.7552	13.134	1.7818	1.5919
	Moyenne — Aver.	1.8534	1.6836	19.816	1.7372	1.7955	20.049	1.8055	1.6123

Période Period	Date	Kayano			Konoike		
		SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	N
Riz glacé à 70% 70% pol. rice	Sept. 29	1.5122	1.3877	22.492	1.9806	1.8163	
	30	1.7227	1.3877	23.880	1.9628	1.9388	
	Moyenne — Aver.	1.6175	1.3877	23.186	1.9717	1.8776	
Riz mi-glacé Half-pol. rice	Oct. 1	1.7708	1.7347	24.477	1.8658	1.9346	
	2	1.6362	1.6938	25.771	2.0060	2.0041	
	Moyenne — Aver.	1.7035	1.7143	25.124	1.9359	1.9694	
Riz glacé à 70% 70% pol. rice	Oct. 3	1.7145	1.6326	25.771	1.7503	1.6122	
	4	1.7133	1.4694	12.139	2.0656	1.7959	
	Moyenne — Aver.	1.7139	1.5510	18.955	1.9079	1.7041	

Sujets / Subject	Période / Period	Absorption d'azote Moyenne journalière — N. intake Average per day: Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Azote trouvé dans l'urine Moyenne journalière — N. in urine Average per day: Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Azote trouvé dans les selles Moyenne journalière — N. in fæces Average per day: Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Gains ou pertes en azote Nitrogen balance	Absorption Moyenne journalière — Absorption Average per day: Azote (gr.) Nitrogen (gms.)	Proteine (gr.) Protein (gms.)	Calories	Pourcentage d'absorption % of absorption
Sugimoto .	Riz glacé à 70% / 70% pol. rice	12.5570	75.8563	9.7016	80.00	1.9505	16.07	+ 0.4849	10.1865	64.6656	265.129	83.93
	Riz mi-glacé / Half-pol. rice	12.8619	80.3869	9.8624	76.68	2.3839	18.53	+ 0.6156	10.4780	65.4875	268.499	81.47
	Riz glacé à 70% / 70% pol. rice	12.1370	75.8563	9.7820	80.59	1.7849	14.71	+ 0.5701	10.3521	64.7006	265.272	85.29
Inoue . . .	*Idem*	12.5575	78.4844	8.9244	71.07	2.0968	16.70	+ 2.5363	10.4607	65.3794	268.056	83.30
		13.5915	84.9369	9.1921	67.63	3.0558	22.48	+ 1.3436	10.5357	65.8451	269.965	77.52
		12.5575	78.4844	9.0045	71.71	2.3418	18.75	+ 1.2139	10.2157	63.8481	261.777	81.25
Ishibashi .	*Idem*	12.9780	81.1125	8.6812	66.89	2.0698	15.95	+ 2.2270	10.9082	68.1763	279.523	84.05
		13.8347	86.4669	8.8976	64.31	2.5131	18.17	+ 2.4240	11.3216	70.7600	290.116	81.83
		12.9780	81.1125	9.1924	70.82	1.8990	14.63	+ 1.8866	11.0790	69.2438	283.900	85.37
Kayano . .	*Idem*	12.7678	79.7988	8.3614	65.49	1.7722	13.88	+ 2.6342	10.9956	68.7225	281.762	86.12
		13.5915	84.9369	8.8172	64.87	2.5702	18.91	+ 2.2041	11.0213	68.8831	282.421	81.09
		12.7678	79.7988	8.7100	68.22	2.2704	17.78	+ 1.7874	10.4974	65.6088	268.996	82.22
Konoike . .	*Idem*	12.5575	78.4844	10.2968	81.99	2.3351	18.59	— 0.0744	10.2224	63.8900	291.949	81.41
		13.5915	84.9369	9.7767	71.93	2.3061	16.97	+ 1.5087	11.2854	70.5338	289.189	83.03
		12.5575	78.4844	9.7016	77.25	1.6949	13.49	+ 1.1610	10.8626	67.8913	278.354	86.51

The Digestibility and Utilisation of the Carbohydrate (as Glucose) and its Caloric Value.

Sujets / Subject	Période / Period	Absorption des hydrates de carbone Moy. jour. (gr.) Carbohydrate intake Average per day (gms.)	Hydrates de carb. élim. dans les selles Moyenne journal. Carbohydrate in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
Sugimoto	Riz glacé à 70% 70% pol. rice	394.08	1.1899	0.30	392.84	1610.644	99.70
	Riz mi-glacé Half pol. rice	365.54	2.3652	0.64	363.17	1488.997	99.36
	Riz glacé à 70% 70% pol. rice	394.03	1.4048	0.36	392.63	1609.783	99.64
Inoue . .	*Idem*	422.09	1.5500	0.37	420.54	1724.314	99.63
		403.75	3.6198	0.89	400.13	1640.533	99.11
		422.09	2.0759	0.49	420.01	1722.041	99.51
Ishibashi.	*Idem*	450.15	1.5432	0.34	448.61	1839.301	99.66
		416.48	2.4085	0.58	414.07	1697.687	99 42
		450.15	1.3160	0.29	448.83	1840.203	99.71
Kayano .	*Idem*	436.12	1.3221	0.30	434.80	1782.680	99.70
		403.75	2.8965	0.71	400.85	1643.485	99.29
		436.12	1.5923	0.37	434.53	1781.573	99.63
Konoike .	*Idem*	422.09	1.5771	0.37	420.51	1724.091	99.63
		403.75	2.2855	0.56	401.46	1645.986	99.44
		422.09	1.5735	0.37	420.52	1724.132	99.63

Digestibility and Utilisation of Crude Fat and its Caloric Value.

Sujets Subject	Période Period	Absorption de la graisse Moy. jour. (gr.) Fat intake Average per day (gms.)	Graisse éliminée dans les selles Moyenne journal. Fat in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
ugimoto	Riz glacé à 70% 70% pol. rice	17.01	2.8691	16.81	14.14	131.502	83.19
	Riz mi-glacé Half-pol. rice	18.00	4.7222	26.23	13.28	123.504	73.77
	Riz glacé à 70% 70% pol. rice	17.01	3.1092	18.28	13.90	129.270	81.72
ioue . .	*Idem*	17.36	2.6308	15.16	14.73	137.049	84.84
		18.66	5.6118	30.07	13.05	121.365	69.93
		17.36	3.3334	19.20	14.03	130.479	80.80
hibashi.	*Idem*	17.71	3.1025	17.52	14.61	135.873	82.48
		18.88	4.2106	22.30	14.67	136.431	77.70
		17.71	3.3507	18.92	14.36	133.548	81.08
ayano .	*Idem*	17.54	2.3866	13.66	15.15	140.895	86.34
		18.66	4.4665	23.99	14.19	131.967	76.01
		17.54	3.8924	22.19	13.65	126.945	77.81
onoike .	*Idem*	17.36	3.0289	17.45	14.33	133.269	82.55
		18.66	5.1517	27.60	13.51	125.643	72.40
		17.36	3.1433	18.11	14.22	132.216	81.89

Digestibility and Utilisation of Crude Ash.

Sujets Subject	Période Period	Absorption des cendres Moy. journ. (gr.) Ash intake Average per day (gms.)	Cendres éliminées dans les selles Moyenne journalière Ash in fæces Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	
Sugimoto .	Riz glacé à 70% . . . 70% polished rice . .	26.95	3.1568	11.71	88.2
	Riz mi-glacé . . . . . Half-polished rice . .	27.17	4.9033	18.05	81.9
	Riz glacé à 70% . . . 70% polished rice . .	26.95	3.3906	12.58	87.4
Inoue. . .	*Idem*	27.12	2.6540	9.79	90.2
		27.46	4.8190	17.55	82.4
		27.12	3.4088	12.57	87.4
Ishibashi .	*Idem*	27.29	2.9852	10.93	89.0
		27.55	4.2248	15.33	84.6
		27.29	3.2715	11.98	88.0
Kayano .	*Idem*	27.21	2.5634	9.42	90.5
		27.46	5.2762	19.21	80.7
		27.21	3.7907	13.93	86.0
Konoike .	*Idem*	27.12	3.2332	11.92	88.0
		27.46	4.5952	16.73	83.2
		27.12	3.4576	12.74	87.2

Percentage of the Caloric Value of Food actually utilised by the Body.

Sujets Subject	Période Period	Absorption des calories Moyenne journalière Calories intake Average per day		Utilisation des calories Caloric utilisation		% de la quantité de calories absorbée % against calories intake
		Calories totales Total calories	Par kg. du poids Per kg. of body weight	Calories totales Total calories	Par kg. du poids Per kg. of body weight	
ugimoto	Riz glacé à 70% 70% pol. rice . .	2085.006	35.17	2007.275	33.86	96.27
	Riz mi-glacé Half-pol. rice . .	1995.979	33.78	1881.000	31.84	94.25
	Riz glacé à 70 % 70% pol. rice . .	2085.006	35.34	2004.325	33.97	96.12
noue . .	*Idem*	2214.082	39.80	2129.419	38.28	96.18
		2177.474	38.90	2031.863	36.29	93.04
		2214.082	39.82	2114.297	38.03	95.50
hibashi .	*Idem*	2343.158	48.51	2254.697	46.68	96.23
		2237.945	46.16	2124.234	43.82	94.93
		2343.158	48.33	2257.651	46.57	96.36
ayano .	*Idem*	2278.668	47.97	2205.337	46.43	96.79
		2177.474	45.84	2057.873	43.32	94.50
		2278.668	47.97	2177.514	45.84	95.56
onoike .	*Idem*	2214.082	43.95	2119.309	42.09	95.99
		2177.474	43.12	2060.818	40.81	94.64
		2214.082	43.93	2134.732	42.35	96.40

IV. *Comparison of 70%-polished Rice with 50%-polished Rice.*

The percentages of digestibility and utilised calories were as follows:

Period	Total Nitrogen	Carbo-hydrate	Crude fat	Crude ash	Calories
Preparatory period (70%-polished rice) .	83.762	99.664	83.880	89.246	96.292
alf-polished rice . .	80.988	99.324	73.962	82.626	94.272
%-polished rice . .	84.128	99.624	80.660	87.240	95.988

The absolute digestible quantity of each constituent of the rice and the abso output of each in the fæces were as shown in the following table:

		Riz glacé à 70 %, cuit Boiled 70 % polished rice	Riz mi-glac cuit Boiled half-polished
Quantité fournie par 100 gr. de riz non glacé . . Amount obtained from 100 gms. of unpolished rice		239.55	242.76
Azote total Total nitrogen	Pourcentage — Percentage . . .	0.4205	0.486
	Quantité — Amount	1.0181	1.180
	Pourcentage de la digestibilité . . . % of digestibility	84.128	80.988
	Quantité totale utilisée . . . . . . Total amount utilised	0.8565	0.956
	Total trouvé dans les selles . . . . Total in the fæces	0.1616	0.224
Hydrates de carbone Carbohydrate		28.06	25.47
		67.22	61.83
	Idem	99.624	99.324
		66.97	61.41
		0.25	0.42
Graisse brute Crude fat		0.35	0.44
		0.84	1.07
	Idem	80.660	73.962
		0.68	0.79
		0.16	0.28
Cendres brutes Crude ash		0.17	0.19
		0.41	0.46
	Idem	87.240	82.606
		0.36	0.38
		0.05	0.08

Experiment V.

The Comparison of the Digestibility of Unpolished Rice and 70%-polished Ric

In this experiment, five men were used as subjects and the following res were obtained.

Sujets Subjects	Période Period	Date	Azote total Total N.	Azote de l'urée Urea N.		Azote de NH^3 Ammonia N.		Azote de l'acide urique Uric acid N.		Azote des bases puriques Purin base N.		Azote des acides aminés Amino acid N.		Azote de la créatinine Creatinin N.		Azote de la créatine Creatin N.	
		Nov.	(g)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
Sugimoto	Riz glacé	10	11.7859	9.0552	76.83	0.2069	1.76	0.0304	0.24	0.1856	1.58	0.5138	4.36	0.5376	4.57	0.0148	0.13
	à 70 %	11	10.7492	8.3869	78.02	0.2045	1.90	0.0290	0.28	0.0838	0.78	0.5974	5.56	0.5474	5.09	0.0206	0.19
	70% pol. rice	Moy-Aver	11.2186	8.7211	77.43	0.2057	1.83	0.0297	0.26	0.1347	1.18	0.5556	4.96	0.5425	4.83	0.0177	0.16
	Riz non glacé	12	9.0643	7.4274	81.94	0.1701	1.88	0.0225	0.22	0.1010	1.12	0.4718	5.20	0.5524	6.06	0.0156	0.17
	Unpol. rice	13	9.8211	8.0496	81.95	0.2094	2.13	0.0237	0.25	0.1766	1 80	0.6317	6.43	0.5484	5.58	0.0101	0.10
		Moy-Aver	9.4427	7.7385	81.95	0.1898	2.01	0.0231	0.24	0.1388	1.46	0.5518	5.82	0.5504	5.82	0.0129	0.14
	Riz glacé	14	10.6636	8.4860	79.59	0.1848	1.73	0.0242	0.24	0.1835	1.73	0.6888	6.46	0.5575	5.25	0.0159	0.13
	à 70 %	15	10.2780	8.1355	79.16	0.1897	1.85	0.0211	0.20	0.1489	1.45	0.7345	7.24	0.5524	5.37	0.0103	0.10
	70% pol. rice	Moy-Aver	10.4708	8.3108	79.38	0.1873	1.79	0.0227	0.22	0.1662	1.59	0.7117	6.85	0.5550	5.31	0.0131	0.12
Higuchi	Riz glacé	10	11.5146	8.0721	70.10	0.2808	2.44	0.0347	0.30	0.1678	1.46	0.7580	6.53	0.5018	4.36	0.0085	0.07
	à 70 %	11	11.2376	10.0021	89.01	0.2971	2.64	0.0376	0.33	0.1836	1.64	0.6226	5.54	0.5218	4.64	0.0134	0.12
	70% pol. rice	Moy-Aver	11.3761	9.0371	79.56	0.2890	2.54	0.0362	0.32	0.1757	1.55	0.6903	6.04	0.5118	4.50	0.0110	0.10
	Riz non glacé	12	9.6355	7.5302	78.25	0.2242	2.33	0.0361	0.39	0.1004	1.04	0.5974	6.20	0.4934	5.12	0.0084	0.09
	Unpol. rice	13	13.0991	10.7193	81.83	0.2684	1.88	0.0450	0.34	0.1973	1.51	0.6602	5.04	0.4976	3.65	0.0126	0.10
		Moy-Aver	11.3673	9.1248	80.04	0.2463	2.11	0.0406	0.37	0.1489	1.28	0.6288	5.62	0.4955	4.39	0.0105	0.10
	Riz glacé	14	13.8706	11.6693	84.13	0.2242	1.62	0.0319	0.23	0.1010	0.73	0.6888	4.97	0.4817	3.47	0.0117	0.09
	à 70 %	15	10.8689	8.1079	74.59	0.2324	2.10	0.0432	0.35	0.1418	1.31	0.6680	6.15	0.5524	5.08	0.0103	0.10
	70% pol. rice	Moy-Aver	12.3698	9.3886	79.36	0.2283	1.86	0.0376	0.29	0.1214	1.02	0.6784	5.56	0.5171	4.28	0.0110	0.10
Ishibashi	Riz glacé	10	9.5641	6.9042	72.19	0.2217	2.32	0.0255	0.27	0.1218	1.28	0.5552	5.80	0.4652	4.86	0.0109	0.11
	à 70 %	11	8.9073	7.1818	80.63	0.2217	2.49	0.0347	0.39	0.1238	1.39	0.7174	8.05	0.4527	5.08	0.0069	0.08
	70% pol. rice	Moy-Aver	8.2357	7.0430	76.41	0.2217	2.41	0.0301	0.32	0.1228	1.34	0.6363	6.93	0.4590	4.97	0.0089	0.10
	Riz non glacé	12	9.1214	7.7129	84.56	0.2094	2.30	0.0275	0.31	0.1170	1.29	0.7574	8.30	0.4652	5.10	0.0072	0.08
	Unpol. rice	13	8.4789	6.1365	72.37	0.1848	2.18	0.0261	0.33	0.1766	2.08	0.7916	9.34	0.4395	5.18	0.0099	0.12
		Moy-Aver	8.8002	6.9247	78.47	0.1971	2.24	0.0268	0.32	0.1468	1.69	0.7745	8.82	0.4524	5.14	0.0086	0.10

(Continuation.)

Sujets Subjects	Période Period	Date	Azote total Total N.	Azote de l'urée Urea N.		Azote de NH^3 Ammonia N.		Azote de l'acide urique Uric acid N.		Azote des bases puriques Purin base N.		Azote des acides aminés Amino acid N.		Azote de la créatinine Creatinin N.		Azote de la créatine Creatin N.	
		Nov.	(g)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
Ishibashi	Riz glacé	14	9.6069	7.6844	79.99	0.1848	1 92	0.0205	0.21	0.0745	0.78	0.9002	9.37	0.4596	4.89	0.0108	0.11
	à 70 %	15	10.5636	7.6844	72.74	0.2168	2.05	0.0347	0.33	0.1112	1.05	0.9002	8.52	0.4596	4.35	0.0145	0.14
	70% pol. rice	Moy-Aver	10.0853	7.6844	76.37	0.2008	1.99	0.0276	0.27	0.0929	0.92	0.9002	8.95	0.4596	4.62	0.0127	0.13
Kayano	Riz glacé	10	8.1652	6.0872	74.55	0.1822	2.23	0.0325	0.40	0.0771	0.95	0.4581	5.61	0.4588	5.62	0.0063	0.08
	à 70 %	11	9.0177	7.2108	79.96	0.2215	2.46	0.0307	0.34	0.1258	1.40	0.6149	6.82	0.4674	5.18	0.0066	0.07
	70% pol. rice	Moy-Aver	8.5915	6.6490	77.26	0.2019	2.35	0.0316	0.37	0.1015	1.18	0.5365	6.32	0.4631	5.40	0.0065	0.08
	Riz non glacé	12	8.6645	7.1074	82.03	0.2242	2.59	0.0354	0.41	0.0734	0.85	0.6203	7.15	0.4596	5.30	0.0107	0.12
	Unpol. rice	13	9.3499	7.8100	83.53	0.2488	2.66	0.0387	0.41	0.1331	1.43	0.6431	6.88	0.4494	4.91	0.0068	0.07
		Moy-Aver	9.0072	7.4587	82.78	0.2365	2.63	0.0371	0.41	0.1033	1.14	0.6317	7.02	0.4545	5.11	0.0088	0.10
	Riz glacé	14	10.0496	8.3182	82.77	0.2119	2.11	0.0311	0.31	0.1466	1.46	0.7688	7.65	0.4562	4.54	0.0107	0.11
	à 70 %	15	10.0496	8.0275	79.88	0.2094	2.08	0.0354	0.35	0.1253	1.25	0.6888	6.85	0.4460	4.44	0.0067	0.07
	70% pol. rice	Moy-Aver	10.0496	8.1729	81.33	0.2107	2.10	0.0333	0.33	0.1360	1.36	0.7288	7.25	0.4511	4.49	0.0087	0.09
Yamamoto	Riz glacé	10	9.2974	5.8913	63.36	0.2168	2.33	0.0205	0.22	0.1088	1.17	0.5885	6.33	0.4527	4.87	0.0069	0.07
	à 70 %	11	8.9358	7.6992	86.22	0.2096	2.35	0.0391	0.44	0.1010	1.13	0.5997	6.71	0.4703	5.36	0.0105	0.12
	70% pol. rice	Moy-Aver	9.1166	6.7953	74.79	0.2132	2.34	0.0298	0.33	0.1049	1.15	0.5941	6.52	0.4615	5.12	0.0087	0.10
	Riz non glacé	12	7.1531	5.5425	77.48	0.2020	2.82	0.0347	0.49	0.1033	1.45	0.5289	7.39	0.4596	6.44	0.0072	0.10
	Unpol. rice	13	9.3927	7.0047	74.69	0.2168	2.31	0.0326	0.35	0.1491	1.59	0.7231	7.70	0.4652	4.95	0.0109	0.12
		Moy-Aver	8.2929	6.2736	76.09	0.2094	2.62	0.0337	0.42	0.1262	1.52	0.6260	7.55	0.4624	5.70	0.0091	0.11
	Riz glacé	14	8.3508	6.4690	77.47	0.1947	2.44	0.0305	0.37	0.0829	1.02	0.7231	8.66	0.4704	5.75	0.0113	0.14
	à 70 %	15	8.2652	5.8142	70.35	0.1827	2.21	0.0305	0.37	0.0941	1.14	0.7122	8.62	0.4898	5.93	0.0072	0.09
	70% pol. rice	Moy-Aver	8.3080	6.1416	73.91	0.1887	2.33	0.0305	0.37	0.0895	1.08	0.7177	8.64	0.4801	5.84	0.0093	0.12

The Daily Output of SO_3, P_2O_5, and NaCl in the Urine.

ériode eriod	Date	Sugimoto			Higuchi			Ishibashi		
		SO_3(g)	P_2O_5(g)	NaCl(g	SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	NaCl(g)
lacé 0% pol. rice	Nov. 10	2.0779	2.0041	27.0	2.1644	2.1632	25.4	1.9511	1.5307	27.1
	11	2.1651	2.0816	24.2	2.2555	2.5042	27.1	1.6759	1.8571	22.3
	Moyenne – Aver.	2.1215	2.0429	25.6	2.2100	2.3337	26.3	1.8135	1.6939	24.7
	12	1.6183	1.4286	22.1	2.0560	2.1428	21.7	1.8039	1.7959	25.7
on glacé . rice	13	1.9559	1.9388	24.8	2.3934	2.5712	26.8	1.4467	1.7756	22.9
	Moyenne – Aver.	1.7871	1.6837	23.5	2.2297	2.3570	24.3	1.6253	1.7858	24.3
acé à % ol. rice	14	1.9408	1.9999	26.6	2.2693	2.3060	27.3	1.8197	1.8367	28.0
	15	2.0560	2.0041	27.1	2.3983	2.2660	25.1	1.9966	1.9387	26.8
	Moyenne – Aver.	1.9984	2.0020	26.9	2.3338	2.2860	26.2	1.9082	1.8877	27.4

iode iod	Date	Kayano			Yamamoto		
		SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	NaCl(g)
ıcé à % ol. rice	Nov. 10	1.6568	0.9370	25.9	1.5636	1.8367	25.1
	11	1.7029	1.3592	23.2	1.6967	2.0090	25.3
	Moyenne – Aver.	1.6799	1.1481	24.6	1.6302	1.9229	25.2
	12	1.8757	1.7756	26.9	1.4992	1.9796	24.0
ı glacé rice	13	1.7776	2.2081	17.1	1.7200	2.2856	28.2
	Moyenne – Aver.	1.8267	1.9919	22.0	1.6096	2.1326	26.1
cé à % l. rice	14	1.8928	1.9387	26.3	1.5897	1.9183	28.0
	15	1.9360	1.9796	25.0	1.4141	1.6326	21.6
	Moyenne – Aver.	1.9144	1.9592	25.7	1.5019	1.7755	24.8

Sujets / Subject	Période / Period	Absorption d'azote Moyenne journalière — N. intake Average per day: Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Azote trouvé dans l'urine Moyenne journalière — N. in urine Average per day: Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Azote trouvé dans les selles Moyenne journalière — N. in fæces Average per day: Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Balance de l'azote — Nitrogen balance	Absorption Moyenne journalière — Absorption Average per day: Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Calories	Pourcentage d'absorption — % of absorption
Sugimoto .	Riz glacé à 70% / 70% pol. rice	12.5575	78.4844	11.2186	89.34	2.3311	18.56	— 0.9922	10.2264	63.9150	262.052	81.44
	Riz non glacé / Unpolished rice	12.4905	78.0659	9.4427	75.60	3.1893	25.53	— 0.1415	9.3012	58.1325	238.343	74.47
	Riz glacé à 70% / 70% pol. rice	12.5575	78.4844	10.4708	83.38	1.9063	15.18	+ 0.1804	10.6512	66.5700	272.937	84.82
Higuchi . .	*Idem*	12.9780	81.1125	11.3761	87.66	3.2128	24.75	— 1.6109	9.7652	61.0325	250.233	75.25
		12.9884	81.1775	11.3673	87.59	3.4312	26.41	— 1.8101	9.5572	59.7325	244.903	73.59
		13.3985	83.7406	12.3698	92.32	2.4974	18.64	— 1.4687	10.9011	68.1319	279.341	81.36
Ishibashi .	*Idem*	12.5575	78.4844	9.2357	73.54	2.1877	17.42	+ 1.1341	10.3698	64.8113	265.726	82.58
		13.4863	84.2894	8.8002	65.25	4.3622	32.34	+ 0.3239	9.1241	57.0256	233.805	67.66
		12.5575	78.4844	10.0853	80.31	1.9810	15.77	+ 0.4912	10.5765	66.1031	271.023	84.23
Kayano . .	*Idem*	13.6088	85.0550	8.5915	63.13	2.9072	21.36	+2.11 01	10.7016	66.8850	274.229	78.64
		13.7353	85.8456	9.0072	65.57	3.8625	28.12	+ 0.8656	9.8728	61.7050	252.991	71.88
		12.5575	78.4844	10.0496	80.00	1.8663	14.86	+ 0.6416	10.6912	66.8200	273.962	85.14
Yamamoto .	*Idem*	12.7678	79.7988	9.1166	71.40	2.1998	17.23	+ 1.4514	10.5680	66.0500	270.805	82.77
		13.7353	85.8456	8.2929	60.37	4.3337	31.55	+ 1.1087	9.4016	58.7600	240.916	68.45
		13.3985	83.7406	8.3080	62.01	2.9986	22.38	+ 2.0919	10.3999	64.9994	266.498	77.62

Digestibility and Utilisation of the Carbohydrate (as Glucose) and its Caloric Value.

Sujets Subject	Période Period	Absorption des hydrates de carbone Moy. jour. (gr.) Carbohydrate intake Average per day (gms.)	Hydrates de carb. élim. dans les selles Moyenne journal. Carbohydrate in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
Sugimoto	Riz glacé à 70% 70% pol. rice	422.09	1.4363	0.34	420.65	1724.665	99.66
	Riz non glacé Unpolished rice	311.47	5.1422	1.65	306.33	1255.953	98.35
	Riz glacé à 70% 70% pol. rice	422.09	1.5053	0.35	420.58	1724.378	99.64
Higuchi .	*Idem*	450.15	2.0095	0.44	448.14	1837.374	99.56
		334.08	3.7644	1.13	330.32	1354.312	98.87
		478.21	2.0240	0.42	476.19	1952.379	99.58
Ishibashi.	*Idem*	422.09	1.5919	0.37	420.50	1724.050	99.63
		356.69	4.7172	1.32	351.97	1443.077	98.68
		422.09	1.9281	0.45	420.16	1722.656	99.55
Kayano .	*Idem*	492.24	2.6044	0.53	489.64	2007.524	99.47
		368.00	5.0661	1.38	362.93	1488.013	98.62
		422.09	1.9137	0.45	420.18	1722.778	99.55
Yamamoto	*Idem*	436.12	2.4668	0.56	433.65	1777.965	99.44
		368.00	7.4378	2.02	360.56	1478.296	97.98
		478.21	7.4378	0.55	475.58	1949.878	99.45

Digestibility and Utilisation of Crude Fat and its Caloric Value.

Sujets Subject	Période Period	Absorption de la graisse Moy. jour. (gr.) Fat intake Average per day (gms.)	Graisse éliminée dans les selles Moyenne journal. Fat in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
Sugimoto	Riz glacé à 70 % 70% pol. rice	17.36	3.5950	20.71	13.76	127.968	79.29
	Riz non glacé Unpol. rice	20.56	9.9752	48.51	10.58	98.394	51.49
	Riz glacé à 70% 70% pol. rice	17.36	2.8381	16.35	14.52	135.036	83.65
Higuchi .	*Idem*	17.71	4.0977	23.19	13.19	126.573	76.81
		21.30	9.6889	45.49	11.61	107.973	54.51
		18.06	4.4452	24.65	13.61	126.573	75.35
Ishibashi	*Idem*	17.36	3.0826	17.76	14.28	132.804	82.24
		22.04	8.2539	37.45	13.79	128.247	62.55
		17.36	2.6802	15.44	14.68	136.524	84.56
Kayano .	*Idem*	18.24	3.8287	20.99	14.41	134.013	79.01
		22.41	10.047	44.65	12.41	115.413	55.35
		17.36	3.2583	18.77	14.10	131.130	81.23
Yamamoto	*Idem*	17.36	1.9770	11.38	15.56	144.708	88.62
		22.41	11.7534	52.44	10.66	99.138	47.56
		18.06	3.7288	20.64	14.33	133.269	79.36

Digestibility and Utilisation of Crude Ash.

Sujets Subject	Période Period	Absorption des cendres Moy. journ. (gr.) Ash intake Average per day (gms.)	Cendres éliminées dans les selles Moyenne journalière Ash in fæces Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	
Sugimoto .	Riz glacé à 70% . . . 70% polished rice . .	27.12	4.0371	11.46	88.54
	Riz non glacé . . . . Unpolished rice . . .	27.78	6.5761	20.16	79.84
	Riz glacé à 70% . . . 70% polished rice . .	27.12	3.7838	10.05	89.95
Higuchi .	*Idem*	27.29	4.0371	14.79	85.21
		28.05	6.5761	23.44	76.56
		27.46	3.7838	13.78	86.22
Ishibashi .	*Idem*	27.12	3.1547	11.63	88.37
		28.29	6.6292	23.43	76.57
		27.12	2.5525	9.41	90.59
Kayano .	*Idem*	27.55	3.9929	14.49	85.51
		28.43	7.7138	27.13	72.87
		27.12	3.3725	12.44	87.56
Yamamoto	*Idem*	27.21	2.9836	10.96	89.04
		28.43	7.4949	26.36	73.64
		27.46	3.8227	13.92	86.08

Percentage of the Caloric Value of Food actually utilised by the Body.

Sujets Subject	Période Period	Absorption des calories Moyenne journalière Calories intake Average per day		Utilisation des calories Caloric utilisation		% de l quantité de calori absorbé
		Calories totales Total calories	Par kg. du poids Per kg. of body weight	Calories totales Total calories	Par kg. du poids Per kg. of body weight	% agains calorie intake
Sugimoto .	Riz glacé à 70% . 70% pol. rice . .	2214.082	37.25	2114.685	35.58	95.52
	Riz non glacé . . Unpolished rice .	1788.584	30.09	1591.690	26.77	88.96
	Riz glacé à 70% . 70% pol. rice . .	2214.082	37.21	2132.351	35.84	96.32
Higuchi .	*Idem*	2343.158	39.06	2214.180	36.91	94.49
		1900.924	31.80	1707.188	28.56	89.81
		2472.234	41.32	2358.293	39.40	95.35
Ishibashi .	*Idem*	2214.082	45.51	2122.580	43.63	95.87
		2013.266	41.40	1805.129	37.12	98.66
		2214.082	45.48	2130.203	43.78	96.04
Kayano .	*Idem*	2512.547	51.75	2415.766	49.76	96.15
		2069.449	43.02	1856.417	38.59	89.70
		2214.082	45.69	2127.870	43.92	96.12
Yamamoto	*Idem*	2278.668	48.81	2193.478	46.99	96.27
		2069.449	44.60	1818.350	39.19	87.87
		2472.234	53.07	2349.645	50.44	95.04

V. *Comparison of 70%-polished Rice with unpolished Rice.*

The percentages of digestibility and utilised calories were as follows:

	Total Nitrogen	Carbo-hydrate	Crude fat	Crude ash	Calories
Preparatory period (70%-polished rice) .	80.136	99.552	81.194	87.334	95.660
Unpolished rice period .	71.210	98.500	54.292	75.896	89.200
70%-polished rice period	82.634	99.554	80.830	88.080	95.774

The absolute digestible quantity of each constituent of the rice and the absolute tput of each in the fæces were as shown in the following table:

		Riz glacé à 70 %, cuit Boiled 70 % polished rice	Riz non glacé cuit Boiled unpolished rice
Quantité fournie par 100 gr. de riz non glacé . . Amount obtained from 100 gms. of unpolished rice. .		239.55	267.06
	Pourcentage — Percentage . . .	0.4205	0.4979
	Quantité — Amount	1.0181	1.3297
	Pourcentage de digestibilité	82.634	71.210
Azote total	% of digestibility		
	Quantité totale utilisé	0.8413	0.9468
Total nitrogen	Total amount utilised		
	Total trouvé dans les selles	0.1768	0.3829
	Total in the fæces		
Hydrates		28.06	22.61
de carbone		67.22	60.38
	Idem	99.554	98.500
Carbohydrate		66.92	59.47
		0.30	0.91
Graisse		0.35	0.74
brute		0.84	1.98
	Idem	80.830	54.292
Crude		0.68	1.07
fat		0.16	0.91
Cendres		0.17	0.27
brutes		0.41	0.72
	Idem	88.080	75.986
Crude		0.36	0.55
ash		0.05	0.17

Experiment VI.

The Comparison of the Digestibility of Unpolished Rice and Half-polished Rice.

In this experiment, five men were used as subjects and the following results obtained.

Daily Output of the Total Nitrogen and the Distribution of Nitrogenous Constituents in the Urine.

Sujets Subjects	Période Period	Date	Azote total Total N.	Azote de l'urée Urea N.		Azote de NH^3 Ammonia N.		Azote de l'acide urique Uric acid N.		Azote des bases puriques Purin base N.		Azote des acides aminés Amino acid N.		Azote de la créatinine Creatinin N.		Azote de la créatine Creatin N.	
		Nov.	(g)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
Narita	Riz mi-glacé	24	7.7564	6.3479	81.84	0.1744	2.25	0.0225	0.29	0.0720	0.93	0.4378	5.64	0.3721	4.80	0.0114	0.15
		25	7.6996	6.3482	82.44	0.1516	1.97	0.0254	0.33	0.1135	1.47	0.4946	6.42	0.3838	5.24	0.0100	0.13
	Half-pol. rice	Moy-Aver	7.7280	6.3481	82.14	0.1630	2.11	0.0240	0.31	0.0928	1.20	0.4662	6.03	0.3780	5.02	0.0107	0.14
	Riz non glacé	26	7.5850	6.3756	84.00	0.1516	2.00	0.0204	0.28	0.1168	1.54	0.5403	7.10	0.3811	5.02	0.0074	0.10
		27	8.0419	6.4441	80.13	0.1401	1.74	0.0247	0.30	0.1290	1.60	0.7459	9.28	0.3740	4.65	0.0070	0.09
	Unpol. rice	Moy-Aver	7.8135	6.4099	82.07	0.1459	1.87	0.0226	0.29	0.1229	1.57	0.6431	8.19	0.3776	4.84	0.0072	0.10
	Riz mi-glacé	28	8.9558	6.6703	74.48	0.1744	1.95	0.0210	0.24	0.1444	1.61	0.9630	10.75	0.3860	4.31	0.0101	0.11
		29	7.2994	5.9934	82.19	1.1401	1.82	0.0210	0.28	0.0692	0.95	0.9858	13.64	0.3721	5.10	0.0114	0.16
	Half-pol. rice	Moy-Aver	8.1276	6.3319	78.34	0.1573	1.89	0.0210	0.26	0.1068	1.28	0.9744	12.20	0.3791	4.71	0.0108	0.14
Higuchi	Riz mi-glacé	24	10.9549	9.2037	84.01	0.3003	2.74	0.0404	0.37	0.0885	0.85	0.4378	4.00	0.5236	4.78	0.0140	0.13
		25	12.0515	9.2517	76.77	0.2824	2.34	0.0404	0.37	0.1465	1.21	0.6040	5.01	0.5263	4.37	0.0113	0.09
	Half-pol. rice	Moy-Aver	11.5032	9 2277	80.39	0.2914	2.54	0.0404	0.37	0.1175	1.03	0.5209	4.51	0.5250	4.58	0.0127	0.11
	Riz non glacé	26	10.5549	8.0622	76.38	0.2574	2.44	0.0446	0.42	0.1258	1.19	0.7054	6.68	0.5282	5.00	0.0095	0.09
		27	12.6570	11.0290	87.14	0.2459	1.94	0.0375	0.30	0.1888	1.06	0.6546	5.18	0.5060	4.00	0.0088	0.06
	Unpol. rice	Moy-Aver	11.6060	9.5456	81.76	0.2517	2.19	0.0411	0.36	0.1573	1.13	0.6800	5.93	0.5172	4.50	0.0092	0.08
	Riz mi-glacé	28	9.0129	7.7075	84.31	0.2660	2.95	0.0347	0.39	0.1513	1.68	1.0201	11.32	0.5236	5.81	0.0140	0.16
		29	11.5475	8.4473	73.15	0.2705	2.34	0.0405	0.35	0.1601	1.39	0.9085	7.87	0.5095	5.93	0.0121	0.11
	Half-pol. rice	Moy-Aver	10.2802	8.0774	78.73	0.2683	2.65	0.0376	0.37	0.1557	1.54	0.9643	9.60	0.5116	5.37	0.0131	0.14
Ishibashi	Riz mi-glacé	24	10.4979	8.3517	79.56	0.2259	2.15	0.0275	0.27	0.1456	1.40	0.5472	5.21	0.4704	4.48	0.0113	0.11
		25	10 4979	7.9647	75.87	0.1773	1.69	0.0350	0.33	0.1680	1.66	0.9058	8.63	0.4895	4.66	0.0123	0.12
	Half-pol. rice	Moy-Aver	10.4979	8.1582	77.72	0.2016	1.92	0.0313	0.30	0.1568	1.53	0.7265	6.42	0.4800	4.57	0.0118	0.12
	Riz non glacé	26	10.0409	7.4354	74.06	0.1659	1.65	0.0287	0.29	0.1682	1.68	0.6660	6.63	0.4898	4.88	0.0072	0.07
		27	9.7555	8.4268	86.48	0.1830	1.99	0.0261	0.27	0.1416	1.45	0.8259	8.46	0.4652	4.77	0.0109	0.11
	Unpol. rice	Moy-Aver	9.8982	7.9244	80.27	0.1745	1.88	0.0274	0.28	0.1549	1.57	0.7460	7.55	0.4725	4.80	0.0091	0.11

(Continuation.)

Sujets Subjects	Période Period	Date	Azote total Total N.	Azote de l'urée Urea N.		Azote de NH^3 Ammonia N.		Azote de l'acide urique Uric acid N.		Azote des bases puriques Purin base N.		Azote des acides aminés Amino acid N.		Azote de la créatinine Creatinin N.		Azote de la créatine Creatin N.	
		Nov.	(g)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%	(g)	(%)
Ishibashi	Riz mi-glacé	28	10.9549	8.9940	83.30	0.2202	2.01	0.0325	0.30	0.1513	1.39	0.6201	5.66	0.4527	4.13	0.0141	0.13
		29	9.8987	8.3783	84.64	0.2002	2.02	0.0347	0.35	0.0719	1.23	1.0201	9.33	0.4652	3 69	0.0109	0.11
	Half-pol. rice	Moy-Aver	10.4268	8.6862	83.97	0.2102	2.02	0.0336	0.33	0.1116	1.06	0.8201	7.50	0.4590	3.91	0.0125	0.12
Kayano	Riz mi-glacé	24	10.9263	9.0326	82.67	0.2288	2.09	0.0201	0.26	0.1626	1.50	0.4946	4.52	0.4560	4.16	0.0107	0.10
		25	9.2414	7.0279	76.05	0.2166	2.34	0.0261	0.29	0.1861	2.01	0.6431	6.96	0.4741	5.13	0.0076	6.08
	Half-pol. rice	Moy-Aver	10.0839	8.0303	78.36	0.2227	2.22	0.0276	0.28	0.1744	1.76	0.5689	5.74	0.4651	4.65	0.0092	0.09
	Riz non glacé	26	9.5850	7.7187	80.52	0.1887	1.96	0.0217	0.21	0.0958	1.00	0.8487	8.85	0.4596	4.79	0.0107	0.11
		27	9.4698	7.6669	80.96	0.1830	2.00	0.0205	0.21	0.1287	1.36	0.5632	5.95	0.4560	4.81	0.0107	0.11
	Unpol. rice	Moy-Aver	9.5274	7.6928	80.74	0.1859	1.98	0.0211	0.21	0.1123	1.18	0.7060	7.40	0.4578	4.80	0.0107	0.11
	Riz mi-glacé	28	9.9839	7.6584	76.81	0.2316	2.32	0.0205	0.20	0.1560	1.57	0.5974	5.98	0.4779	4.79	0.0155	0.16
		29	9.4127	7.8893	83.82	0.2002	2.29	0.0276	0.30	0.1280	1.36	0.7088	7.53	0.4704	5.00	0.0113	0.12
	Half-pol. rice	Moy-Aver	9.6983	7.7739	80.32	0.2159	2.31	0.0241	0.25	0.1420	1.47	0.6531	6.76	0.4742	4.90	0.0134	0.14
Yamamoto	Riz mi-glacé	24	9 2128	7.6504	83.03	0.1830	1.12	0.0205	0.22	0.0769	0.83	0.4204	4.56	0.4817	5.09	0.0117	0.13
		25	7.7564	6.5880	84.93	0.2030	2.62	0.0237	0.30	0.0613	0.86	0.5974	7.70	0.5018	6.47	0.0129	0.17
	Half-pol rice	Moy-Aver	8.4846	7.1192	83.98	0.1930	1.87	0.0221	0.26	0.0691	0.85	0.5089	6.13	0.4918	5.78	0.0123	0.15
	Riz non-glacé	26	7.8135	5.9511	76.17	0.1716	2.20	0.0261	0.34	0.0942	1.22	0.6431	8.23	0.4817	7.16	5.0117	0.15
		27	9.1261	7.0890	77.68	0.1945	2.13	0.0205	0.22	0.1623	1.78	0.6660	7.30	0.4895	5.36	0.0123	0.14
	Unpol. rice	Moy-Aver	8.4698	6.5201	76.93	0.1831	2.17	0.0233	0.28	0.1283	1.50	0.6546	7.77	0.4856	6.76	0.0120	0.15
	Riz mi-glacé	28	8.6702	6.6676	76.90	0.1973	2.28	0.0211	0.25	0.1204	1.14	0.7002	8.08	0.5018	5.79	0.0085	0.10
		29	10.8406	8.5229	78.62	0.2774	2.56	0.0276	0.24	0.1078	0.99	0.8031	7.41	0.5147	4.75	0.0179	0.17
	Half-pol. rice	Moy-Aver	9.7554	7.5953	77.76	0.2374	2.42	0.0244	0.25	1.1141	1.07	0.7517	7.75	0.5083	5.27	0.0132	0 14

The Daily Output of SO_3, P_2O_5, and NaCl in the Urine.

Période Period	Date	Narita			Higuchi		
		SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	N
Riz mi-glacé Half-pol. rice	Nov. 24	1.4278	1.4000	21.59	2.1363	2.3636	2
	25	1.5156	1.4545	25.87	2.1079	2.8181	2
	Moyenne – Aver.	1.4717	1.4273	23.73	2.1221	2.5909	2
Riz non glacé Unpol. rice	26	1.3579	1.4364	23.68	2.0656	2.4364	2
	27	1.4045	1.4745	26.46	2.0848	2.4183	2
	Moyenne – Aver.	1.3812	1.4455	25.07	2.0752	2.4274	2
Riz mi-glacé Half-pol. rice	28	1.5581	1.4726	26.46	2.0416	2.4545	2
	29	1.4271	1.1818	24.44	1.9101	2.5000	2
	Moyenne – Aver.	1.4926	1.3272	25.45	1.9759	2.4773	2

Période Period	Date	Ishibashi			Kayano			Yamamot	
		SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)
Riz mi-glacé Half-pol. rice	Nov. 24	1.7604	1.6182	27.46	1.7961	1.6182	26.57	1.7199	2.2182
	25	1.9134	1.8291	16.52	1.6905	1.7654	26.06	1.3665	1.9818
	Moyenne – Aver.	1.8369	1.7237	21.99	1.7433	1.6918	26.32	1.5432	2.1000
Riz non glacé Unpol. rice	26	1.7589	1.7091	22.29	1.6850	1.6545	24.68	1.3853	1.8000
	27	1.6699	1.8181	25.87	1.6219	2.0747	26.46	1.5314	2.2727
	Moyenne – Aver.	1.7144	1.7636	24.08	1.6535	1.8646	25.57	1.4584	2.0364
Riz mi-glacé Half-pol. rice	28	1.2053	1.6182	26.67	1.7906	1.8181	23.88	1.6006	1.8727
	29	1.7084	1.7273	24.44	1.6041	1.6364	24.87	1.8400	2.1818
	Moyenne – Aver.	1.8069	1.6728	25.56	1.6974	1.7273	24.38	1.7203	2.0273

Sujets / Subject	Période / Period	Absorption d'azote Moyenne journalière — N. intake Average per day: Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Azote trouvé dans l'urine Moyenne journalière — N. in urine Average per day: Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Azote trouvé dans les selles Moyenne journalière — N. in fæces Average per day: Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Gains ou pertes en azote — Nitrogen balance	Absorption Moyenne journalière — Absorption Average per day: Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Calories	Pourcentage d'absorption — % of absorption
Narita . . .	Riz mi-glacé / Half-pol. rice	12.8619	80.3869	7.7280	60.08	2.7052	21.03	+ 2.4287	10.1567	63.4794	260.266	78.97
	Riz non glacé / Unpolished rice	13.2374	82.7338	7.8135	59.02	2.8651	21.65	+ 2.5588	10.3723	64.8269	265.790	78.35
	Riz mi-glacé / Half-pol. rice	13.5915	48.9369	8.1276	59.79	2.4287	17.87	+ 3.0352	11.1628	69.7675	286.047	82.13
Higuchi . .	*Idem*	14.3211	89.5069	11.5032	80.32	2.9188	20.38	— 0.1009	11.4023	71.2644	292.184	79.62
		12.9884	81.1775	11.6060	89.35	2.9165	22.45	— 1.5341	10.0719	62.9494	258.093	77.55
		14.8075	92.5409	10.2802	69.43	2.1404	14.45	+ 2.3869	12.6671	79.1694	324.595	85.55
Ishibashi .	*Idem*	12.3755	77.3469	10.4979	84.83	2.0691	16.72	— 0.1915	10.3064	64.4150	264.102	83.28
		12.4905	78.0659	9.8982	79.24	3.2970	26.39	— 0.0747	9.1935	57.4594	235.584	73.61
		12.3755	77.3469	10.4268	84.25	1.8934	15.30	+ 0.0553	10.4821	65.5131	268.604	84.70
Kayano . .	*Idem*	12.8619	80.3869	10.0839	78.41	2.0562	16.00	— 0.7218	10.8057	67.5356	276.896	84.00
		12.2416	75.9475	9.5274	77.82	2.9852	24.38	— 0.2710	9.2564	57.8525	237.195	75.62
		12.8619	80.3869	9.6983	75.41	2.4089	18.73	+ 0.7547	10.4530	65.3313	267.858	81.27
Yamamoto .	*Idem*	12.8619	80.3869	8.4846	65.97	1.9648	15.27	+ 2.4125	10.8971	68.1069	279.238	84.73
		12.7395	79.6219	8.4698	66.48	3.4434	27.03	+ 0.8263	9.2961	58.1006	238.212	72.97
		12.8619	80.3869	9.7554	75.85	2.4660	19.17	+ 0.6405	10.3959	64.9744	266.395	80.83

Digestibility and Utilisation of the Carbohydrate (as Glucose) and its Caloric Value.

Sujets Subject	Période Period	Absorption des hydrates de carbone Moy. jour. (gr.) Carbohydrate intake Average per day (gms.)	Hydrates de carb. élim. dans les selles Moyenne journal. Carbohydrate in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
Narita	Riz mi-glacé Half-pol. rice	365.54	2.6690	0.73	362.87	1487.767	99.27
	Riz non glacé Unpolished rice	345.39	3.7656	1.09	341.62	1400.642	98.91
	Riz mi-glacé Half-pol. rice	403.75	2.6486	0.65	401.10	1644.510	99.35
Higuchi	*Idem*	441.95	3.1181	0.70	438.83	1799.203	99.30
		334.08	3.9571	1.18	330.12	1353.492	98.82
		468.42	2.6159	0.55	464.80	1905.680	99.45
Ishibashi	*Idem*	340.07	1.5521	0.47	338.52	1387.932	99.53
		311.47	4.8609	1.56	306.61	1257.101	98.44
		340.07	2.6752	0.78	337.39	1383.299	99.22
Kayano	*Idem*	365.54	2.2614	0.62	363.28	1489.448	99.38
		300.17	4.3639	1.45	295.81	1212.821	98.55
		365.54	2.6924	0.74	362.85	1487.685	99.26
Yamamoto	*Idem*	365.54	2.7251	0.74	362.81	1487.521	99.26
		322.78	5.4843	1.73	317.30	1300.930	98.27
		365.54	4.4033	1.20	361.14	1480.674	98.80

Digestibility and Utilisation of Crude Fat and its Caloric Value.

Sujets Subject	Période Period	Absorption de la graisse Moy. jour. (gr.) Fat intake Average per day (gms.)	Graisse éliminée dans les selles Moyenne journal. Fat in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
Narita .	Riz mi-glacé Half-pol. rice	18.00	4.4277	24.60	13.57	126.201	75.40
	Riz non glacé Unpolished rice	21.67	8.4100	38.81	13.26	123.318	61.19
	Riz mi-glacé Half-pol. rice	18.66	5.5155	29.56	13.14	122.202	70.44
Higuchi .	*Idem*	19.32	6.1228	31.69	13.20	122.760	68.31
		21.30	9.2548	43.45	12.05	112.065	56.55
		19.76	4.8462	24.52	14.91	138.663	75.48
shibashi	*Idem*	17.56	3.4995	19.93	14.06	130.758	80.07
		20.56	9.6984	47.17	10.86	100.998	52.83
		17.56	4.4395	25.27	13.12	122.016	74.73
Kayano .	*Idem*	18.00	3.5227	19.57	14.48	134.664	80.43
		20.19	8.9372	44.26	11.25	104.625	55.74
		18.00	6.2927	34.96	11.71	108.903	65.04
Yamamoto	*Idem*	18.00	4.0222	22.35	13.98	130.014	77.65
		20.93	8.4961	40.59	12.43	115.599	59.41
		18.00	5.2555	29.20	12.74	118.482	70.80

Digestibility and Utilisation of Crude Ash.

Sujets Subject	Période Period	Absorption des cendres Moy. journ. (gr.) Ash intake Average per day (gms.)	Cendres éliminées dans les selles Moyenne journalière Ash in fæces Average per day		Pourcentag d'ab-sorption % of absorptio
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	
Narita . .	Riz mi-glacé	27.17	4.4592	16.41	83.59
	Half-polished rice . .				
	Riz non glacé	28.29	6.3207	22.34	77.66
	Unpolished rice . . .				
	Riz mi-glacé	27.46	5.0277	18.31	81.69
	Half-polished rice . .				
Higuchi .	*Idem*	27.74	5.5187	19.60	80.10
		28.05	6.1621	21.96	78.04
		27.93	4.1369	14.81	85.19
Ishibashi .	*Idem*	26.98	3.3794	12.53	87.47
		27.78	7.3595	26.41	73.59
		26.98	3.6036	13.35	86.65
Kayano .	*Idem*	27.17	3.9306	14.46	85.54
		27.65	6.2399	22.56	77.44
		27.17	4.2848	15.77	84.23
Yamamoto	*Idem*	27.17	3.9885	14.64	85.36
		27.92	4.6144	16.53	83.47
		27.17	4.0108	14.76	85.24

Percentage of the Caloric Value of Food actually utilised by the Body.

Sujets Subject	Période Period	Absorption des calories Moyenne journalière Calories intake Average per day		Utilisation des calories Caloric utilisation		% de la quantité de calories absorbées % against calories intake
		Calories totales Total calories	Par kg. du poids Per kg. of body weight	Calories totales Total calories	Par kg. du poids Per kg. of body weight	
Narita . .	Riz mi-glacé . . Half-pol. rice . .	1995.979	45.75	1874.234	42.98	93.94
	Riz non glacé . . Unpolished rice .	1957.117	44.83	1789.750	41.00	91.45
	Riz mi-glacé . . Half-pol. rice . .	2177.474	49.83	2052.759	46.90	94.12
Higuchi .	*Idem*	2358.928	38.73	2214.147	36.35	93.85
		1900.924	31.40	1723.650	28.47	90.67
		2479.911	40.85	2368.938	39.02	95.52
Ishibashi .	*Idem*	1874.996	38.82	1782.792	36.91	95.08
		1788.584	37.05	1593.683	33.01	89.10
		1874.996	38.81	1773.919	36.70	94.56
Kayano .	*Idem*	1995.979	41.11	1901.008	39.06	95.01
		1730.127	35.78	1554.641	32.15	89.85
		1995.979	41.19	1864.446	38.48	93.42
Yamamoto	*Idem*	1995.979	43.01	1896.773	40.88	95.04
		1850.675	40.21	1654.741	35.97	89.45
		1995.979	43.11	1865.551	40.29	93.46

VI. *Comparison of 50%-polished Rice with unpolished Rice.*

The percentages of digestibility and utilised calories were as follows:

	Total Nitrogen	Carbo-hydrate	Crude fat	Crude ash	Calories
Preparatory period (half-polished rice) .	82.120	99.356	76.372	84.412	94.584
Unpolished rice period .	75.620	98.598	57.144	78.040	90.104
Half-polished rice period	82.896	99.216	71.298	84.600	94.216

The absolute digestible quantity of each constituent of the rice and the absolu output of each in the fæces were as shown in the following table.

		Riz mi-glacé cuit Boiled half-polished rice	Riz non glacé cuit Boiled unpolished rice
Quantité fournie par 100 gr. de riz non glacé . . . Amount obtained from 100 gms. of unpolished rice		242.76	267.06
Azote total Total nitrogen	Pourcentage — Percentage . . .	0.4864	0.4979
	Quantité — Amount	1.1808	1.3297
	Pourcentage de digestibilité . . . % of digestibility	82.896	75.620
	Quantité totale utilisée . . . . . Total amount utilised	0.9788	1.0055
	Total trouvé dans les selles . . . . Total in the fæces	0.2020	0.3242
Hydrates de carbone Carbohydrate	*Idem*	25.47 61.83 99.216 61.35 0.48	22.61 60.38 98.598 59.53 0.85
Graisse brute Crude fat	*Idem*	0.44 1.07 71.298 0.76 0.31	0.74 1.98 57.144 1.13 0.85
Cendres brutes Crude ash	*Idem*	0.19 0.46 84.600 0.39 0.07	0.27 0.72 78.040 0.56 0.16

verage Mean (%) of the Digestibility of Rice (each Constituent) in Different Grades of Polishing.

Période (degré de glaçage) Period (grades of polishing)	Azote total Total N.	Hydrates de carbone (comme le glycose) Carbohydrate (as glucose)	Graisse brute Crude fat	Cendres brutes Crude ash
Riz glacé. . . . . Polished rice	85.789	99.682	86.816	90.881
Riz glacé à 70% . . . 70% polished rice . .	82.996	99.591	80.510	87.305
Riz mi-glacé . . . . . Half-polished rice . .	81.983	99.296	74.357	84.365
Riz non glacé . . . . Unpolished rice . . .	74.865	98.611	58.272	77.985

mparison of the Utilised Calories in Each Experiment (Percentage of Total Utilised Calories against Total Calories Intake).

	1re exp. 1st exp.	2me exp. 2nd exp.	3me exp. 3rd exp.	4me exp. 4th exp.	5me exp. 5th exp.	6me exp. 6th exp.
Riz glacé. . . . . Polished rice . . .	97.026	97.376	96.748			
Riz glacé à 70% . . 70% polished rice .	95.776			95.988	95.774	
Riz mi-glacé . . . . Half-polished rice . .		94.852		94.272		94.216
Riz non glacé. . . . Unpolished rice . .			89.468		89.200	90.104

Conclusion.

1. The digestibility and utilisation of rice are always better when the grades ›olishing are raised.

The ratio of the actual energy derived from the rice to the total energy value ,he rice eaten varied in the same direction as the digestibility.

2. The quantity of rice eaten to supplement standard side dishes was always ıter when the polishing grade of rice was higher; when unpolished rice was eaten, consumption of side dishes was obviously small and it appeared that the caloric ıke was insufficient for the requirements of the body.

3. The excretion rate of total nitrogen (*i.e.* the ratio of total nitrogen in t urine to total ingested nitrogen) was higher when the rice was more highly polishe it seemed on the other hand that the excretion rate of urea (the ratio of urea total nitrogen in the urine) was generally lower under similar circumstances. Wi regard to the distribution of other nitrogenous substances in the urine, we did n find any significant differences.

4. The quantity of total sulphur in the urine was always proportional to t total nitrogen.

5. The output of phosphate in the urine generally decreased as the grade polishing of the ingested rice was raised; no such difference was found in the outp of chloride.

6. The output of fæces decreased as the grade of polishing of the rice w raised.

7. The quantity of nitrogenous substances in half-polished rice is very nearly t same as in unpolished rice.

8. Under the same conditions, the absolute quantity of each ingredient of r in the fæces was always smaller when the rice was polished to a higher degree.

8.

THE DIGESTIBILITY AND UTILISATION OF RICE COOKED BY DIFFERENT METHODS.

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(From the Imperial State Institute for Nutrition, Tokyo.)

The abstracts of these experiments were published at the tenth, eleventh and elfth meetings of the Imperial State Institute for Nutrition in Tokyo, and at the ird meeting of the Physiological Society of Japan.

In Japan, rice is used in many forms besides that of ordinary boiled rice. There ve been no previous references to this subject in the literature, so we have investi-ted it under Dr. Saiki's supervision.

Our experiments were conducted under ordinary conditions of life, and the men the Institute who acted as subjects resided at the Institute during the period experiment. The temperature and the body weight of the subjects were recorded ch day. Each experiment lasted six days. The first two days were a preparatory riod, during which ordinary boiled rice was taken as the main item of food; during e third and fourth days the experimental food was taken; and during the fifth d sixth days and the morning of the seventh day boiled rice was again taken. Experiment VIII, during the first two days "okowa" was taken; during the third d fourth days "mochi"; and during the fifth and sixth days and the morning of the venth day "okowa" was again taken.

The rice used was Shonai rice, quality No. 3; it was polished at the Institute a special polishing machine, without the use of polishing powder. Before each al, eight "go" (1,122 gms.) of the polished rice were washed until the wash-water s almost clear and then cooked. The amount of water used in cooking the rice s two litres.

The side dishes eaten by each subject were kept constant throughout the experi-nt, while the main food and drinking-water were taken *ad libitum*. The quantities the two latter were recorded.

The daily side dishes were as follows:

Meal	Side dishes	Materials	Quantities
Morning meal	Miso soup	Miso	38 gms.
		Wakame (wet)	20 »
		Dried fish powder	3 »
		Water	300 cc.
	Takuwan		30 gms.
Noon meal	Nitsuke (stew)	Pork	50 gms.
		Potato	100 »
		Tofu (toasted)	50 »
		Burdock	30 »
		Sugar	2 »
		Shoyu	30 cc.
		Water	300 »
	Daikon (grated)	Daikon	30 gms.
		Shoyu	5 cc.
Evening meal	Soup	Tofu	100 gms.
		Dried fish powder	3 »
		Shoyu	25 cc.
		Water	300 »
	Nuta (fish salad)	Mackerel	40 gms.
		Cabbage	25 »
		Onion	15 »
		Miso	20 »
		Vinegar	20 cc.
		Sugar	15 gms.
	Takuwan		30 gms.

The daily quantity of each constituent of the ration (total nitrogen, carb hydrate as glucose, crude fat and crude ash) and the output of fæces were estimat daily by the methods reported in the previous experiment on "The Digestibili and Utilisation of Rice in Different Grades of Polishing". The daily output of uri was analysed to determine the nitrogen balance and the variations in the nitrogenc compounds, P_2O_5, SO_3 and NaCl in the urine. The caloric value of the food actua utilised was also calculated.

Experiment I.

Comparison of the Digestibility and Utilisation of "Dango" (made of Polished Ric and Ordinary Boiled Rice.

For the preparation of "Dango", 650 cc. of water were added to 1,200 gm of powdered rice. The mixture was then formed into balls of 50 to 60 gms. in weig and cooked by the subjects themselves in 400 cc. of water. To prevent any loss food, the water in which the "dango" had been cooked was used in making the so for the evening meal.

Sujets Subjects	Période Period	Date	Azote total Total N.	Azote de l'urée Urea N.		Azote de NH^3 Ammonia N.		Azote de l'acide urique Uric acid N.		Azote des bases puriques Purin base N.		Azote des acides aminés Amino acid N.		Azote de la créatinine Creatinin N.		Azote de la créatine Creatin N.	
		Fev. - Feb.	(g)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
Sugimoto	Riz cuit Boiled rice	1	10.8707	9.3384	86.20	0.8154	7.50	0.2338	2.15	0.0206	0.19	0.1463	1.34	0.4895	4.50	0.0081	0.07
		2	10.5616	8.8571	82.91	0.6387	6.05	0.2358	2.23	0.0167	0.16	0.1634	1.55	0.5376	5.00	0.0148	0.14
		Moy-Aver	10.7162	9.0978	84.56	0.7771	6.78	0.2348	2.19	0.0187	0.18	0.1549	1.45	0.5131	4.30	0.0115	0.11
	Dango	3	11.1798	9.3751	84.86	0.4676	4.18	0.2308	2.06	0.0219	0.20	0.1766	1.58	0.5103	4.56	0.0088	0.08
		4	11.0768	9.3417	84.28	0.6045	5.46	0.2010	1.81	0.0206	0.18	0.1542	1.39	0.5236	4.73	0.0140	0.13
		Moy-Aver	11.1283	9.3584	84.07	0.5361	4 82	0.2159	1.99	0.0213	0.19	0.1654	1.40	0.5169	4.65	0.0114	0.11
	Riz cuit Boiled rice	5	11.0253	9.1771	83.24	0.5930	5.38	0.1961	1.78	0.0205	0.19	0.1348	1.22	0.5018	4.55	0.0172	0.16
		6	10.3040	8.6260	83.71	0.6159	5.98	0.2159	2.10	0.0213	0.21	0.1548	1.50	0.5018	4.87	0.0218	0.21
		Moy-Aver	10.6647	8.9016	83.48	0.6045	5.68	0.2060	1.94	0.0209	0.20	0.1448	1.36	0.5018	4.71	0.0195	0.19
Higuchi	Riz cuit Boiled rice	1	9.7373	7.3938	77.99	0.5930	6.09	0.2015	2.07	0.0235	0.24	0.1510	1 55	0.4652	4.78	0.0109	0.11
		2	11.0253	9.1581	83.06	0.7071	6.41	0.2234	2.00	0.0155	0.14	0.1595	1.45	0.4741	4.30	0.0114	0.10
		Moy-Aver	10.8313	7.5960	80.53	0.6501	6.25	0.2125	2.04	0.0195	0.19	0.1553	1.50	0.4697	4.54	0.0112	0.11
	Dango	3	11.1243	9.2339	83.01	0.5132	4.61	0.1936	1.74	0.0193	0.17	0.1980	1.74	0.4652	4.18	0.0109	0.09
		4	11.1798	9.2733	82.94	0.6957	6.22	0.2134	1.91	0.0200	0.18	0.1970	1.76	0.4652	4.16	0.0147	0.13
		Moy Aver	11.1521	9.2536	82.98	0.6045	5.42	0.2035	1.83	0.0197	0.18	0.1975	1.75	0.4652	4.17	0.0128	0.11
	Riz cuit Boiled rice	5	11.3344	8.9004	78.52	0.6729	5.93	0.1986	1.75	0.0219	0 19	0.1402	1.23	0.4817	4.25	0.0117	0 10
		6	10.7677	9.2610	86.00	0.6558	6.09	0.1986	1.84	0.0206	0 19	0.1595	1.48	0.4652	4.32	0.0147	0.14
		Moy-Aver	11.0511	9.0807	82.26	0.6644	6.01	0.1986	1.80	0.0213	0.19	0.1499	1.36	0.4735	4.29	0.0132	0.12
Momoyeda	Riz cuit Boiled rice	1	9.8403	7.9528	80.62	0.6843	6.95	0.2278	2.31	0.0193	0.19	0.1463	1.48	0.5190	5.27	0 0135	0 13
		2	10.8192	9.3633	86.54	0.6729	6.22	0.2234	2.06	0.0155	0.14	0.1782	1.50	0.5790	5.25	0.0114	0.11
		Moy-Aver	10.3298	8.6581	83.68	0.6786	6.59	0.2256	2.19	0.0174	0.17	0.1623	1.49	0.5490	5.26	0.0125	0.12
	Dango	3	11.5920	9.3499	85.66	0.5246	4.52	0.2506	2.16	0.0206	0.18	0.1935	1.67	0.5427	4.68	0.0201	0.17
		4	11.9526	9.6142	80.43	0.6501	5.45	0.2035	1.70	0 0232	0.12	0.2150	1.79	0.5190	4.34	0.0196	0.17
		Moy-Aver	11.7723	9.4821	83.05	0.5874	4.99	0.2271	1.93	0.0219	0.15	0.2043	1.73	0.5309	4.51	0.0199	0.17

(Continuation.)

Sujets Subjects	Période Period	Date	Azote total Total N. (g)	Azote de l'urée Urea N.		Azote de NH^3 Ammonia N.		Azote de l'acide urique Uric acid N.		Azote des bases puriques Purin base N.		Azote des acides aminés Amino acid N.		Azote de la créatinine Creatinin N.		Azote de la créatine Creatin N.	
		Fev. - Feb.		(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
Momoye-da	Riz cuit Boiled rice	5	11.5920	8.8082	80.98	0.6671	5.75	0.1812	1.56	0.0235	0.20	0.1683	1.59	0.5236	4.51	0.0140	0.12
		6	12.3648	9.3247	80.41	0.7025	5.68	0.2060	1.66	0.0219	0.18	0.1634	1.32	0.5190	4.19	0.0196	0.16
		Moy-Aver	11.9784	9.0665	80.70	0.6848	5.72	0.1946	1.61	0.0227	0 19	0.1659	1.46	0.5213	4.35	0.0168	0.14
Tanaka	Riz cuit Boiled rice	1	9.8403	8.2292	83.63	0.4675	4.75	0.1940	1.97	0.0258	0.26	0 1510	1.53	0.4817	4.89	0.0201	0.20
		2	10.5616	8.8195	83.50	0.5018	4.75	0.2333	2.21	0.0193	0.18	0.1689	1.59	0.4856	4.59	0.0162	0.15
		Moy-Aver	10.2010	8.3848	83.57	0.4847	4.75	0 2137	2.09	0.0226	0.22	0.1600	1.56	0.4837	4.74	0.0182	0.18
	Dango	3	11.4889	9.0448	78.73	0.4220	3.67	0.2035	1.77	0.0235	0.20	0.2076	1.81	0.4895	4.26	0.0340	0.29
		4	10.5101	8.5905	81.73	0.5702	5.52	0.1936	1.84	0.0174	0.16	0.1963	1.87	0.4779	4.54	0.0324	0.30
		Moy-Aver	10.9995	8.8177	80.23	0.4961	4.60	0.1986	1.81	0.0205	0.18	0.2020	1.84	0.4837	4.40	0.0332	0.30
Yasuda	Riz cuit Boiled rice	5	10.3859	8.3939	80.82	0.5018	4.83	0.2060	1.98	0.0251	0.24	0.1683	1.62	0.4856	4.67	0.0204	0.19
		6	10.4374	8.6165	82.55	0.5246	5.02	0.2308	2.21	0.0232	0.22	0.1634	1.56	0.4817	4.61	0.0372	0.35
		Moy-Aver	10.4117	8.5052	81.69	0.5132	4.93	0.2184	2.10	0.0242	0.23	0.1659	1.59	0.4837	4.64	0.0288	0.27
	Riz cuit Boiled rice	1	9.9434	8.5271	85.75	0.5246	5.26	0.2134	2.14	0.0290	0.29	0.1416	1.42	0.5376	5.40	0.0098	0.10
		2	11.2481	9.1265	81.13	0.5319	4.73	0.2573	2.29	0.0219	0.19	0.1779	1.58	0.5510	4.90	0.0102	0.09
		Moy-Aver	10.5958	8.8268	83.44	0.5283	5.00	0.2354	2.22	0.0255	0.24	0.1598	1.50	0.5443	5.15	0.0100	0.10
	Dango	3	11.2314	8.7187	77.63	0.4448	3.96	0.2506	2.23	0.0206	0.17	0.1793	1.59	0.5427	4.83	0.0149	0.13
		4	11.1798	8.8618	79.26	0.5816	5.19	0.2085	1.86	0.0213	0.19	0.1823	1.63	0.5282	4.71	0.0192	0.17
		Moy-Aver	11.2056	8.7903	78.45	0.5132	4.58	0.2296	2.05	0.0210	0.18	0.1808	1.61	0.5360	4.77	0.0171	0.15
	Riz cuit Boiled rice	5	11.4374	8.9332	78.11	0.6501	5.68	0.2234	1.95	0.0232	0.20	0.1636	1.43	0.5376	4.70	0.0098	0.08
		6	11.5044	9.7249	84.53	0.5518	4.79	0.2134	1.85	0.0122	0.19	0.1961	1.70	0.5299	4.60	0.0128	0.11
		Moy-Aver	11.4709	9.3291	81.32	0.6010	5.24	0.2184	1.90	0.0222	0.20	0.1799	1.57	0.5338	4.65	0.0113	0.10

Daily Output of SO_3, P_2O_5, and NaCl in the Urine.

riode riod	Date	Sugimoto			Higuchi		
		SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	NaCl(g)
	Fév.-Feb.						
uit	1	1.8462	1.6992	20.7	1.8112	1.6638	14.7
d rice	2	1.7323	1.9824	18.5	1.8750	2.0621	19.4
	Moyenne — Aver.	1.7893	1.8408	19.6	1.8431	1.8630	17.1
	3	1.9039	1.9205	18.4	1.9710	1.8939	19.7
o	4	108.57	1.9116	17.4	1.7989	1.9293	17.5
	Moyenne — Aver.	1.8548	1.9111	17.9	1.8850	1.9116	18.6
	5	1.7054	1.8562	16.7	1.6561	2.0178	17.7
nit	6	1.8256	1.7523	15.0	1.8558	1.9647	20.3
d rice	Moyenne — Aver.	1.7655	1.8043	15.9	1.7560	1.9913	19.0

riode riod	Date	Momoyeda			Tanaka			Yasuda		
		SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	NaCl(g)
	Fév.-Feb.									
nit	1	1.7845	1.6815	17.7	1.7769	1.4691	19.3	1.8770	1.8231	19.5
d rice	2	1.9935	2.1152	17.6	1.7529	1.9028	18.2	2.1334	1.9028	20.5
	Moyenne — Aver.	1.8890	1.8984	17.7	1.7649	1.6860	18.8	2.0052	1.8630	20.0
	3	2.0224	1.9293	18.0	2.0699	2.0532	20.0	2.0024	2.0532	15.1
	4	1.9792	1.8939	17.7	1.6316	1.7169	15.9	1.9012	2.0629	15.5
	Moyenne — Aver.	2.0008	1.9111	17.9	1.8508	1.8851	18.0	1.9518	2.0581	15.3
	5	2.0227	2.0444	16.6	1.7351	1.8496	19.5	1.8908	2.1594	16.1
it	6	1.9785	1.9559	19.4	1.9785	1.9293	18.7	1.9516	1.7700	19.0
rice	Moyenne — Aver.	2.0006	2.0002	18.0	1.8568	1.8895	19.1	1.9212	1.9647	17.6

Nitrogen Balance: the Digestibility and Utilisation and Caloric Value.

Sujets / Subject	Période / Period	Absorption d'azote Moyenne journalière — N. intake Average per day		Azote trouvé dans l'urine Moyenne journalière — N. in urine Average per day		Azote trouvé dans les selles Moyenne journalière — N. in fæces Average per day		Gains ou pertes en azote — Nitrogen balance	Absorption Moyenne journalière — Absorption Average per day			Pourcentage d'absorption — % of absorption
		Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake		Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Calories	
Sugimoto	Riz cuit / Boiled rice	12.9552	80.9700	10.7162	82.72	2.2266	17.19	+ 0.0124	10.7286	67.0538	274.921	82.81
	Dango / Boiled rice	13.9711	81.6944	11.1283	85.13	2.0962	16.03	— 0.1534	10.9749	68.5931	281.232	83.97
	Riz cuit / Boiled rice	12.9552	80.9700	10.6647	82.32	2.4053	18.56	— 0.1148	10.5499	65.9369	270.341	81.44
Higuchi	*Idem*	12.9552	80.9700	10.3813	80.13	2.4717	19.08	+ 0.1022	10.4835	65.5219	268.640	80.92
		13.9133	86.9581	11.1521	80.16	2.3479	16.87	+ 0.4133	11.5654	72.2838	296.364	83.13
		13.1467	82.1669	11.0511	84.06	2.7485	20.90	— 0.6529	10.3982	64.9888	266.454	79.09
Momoyeda	*Idem*	13.7210	85.7562	10.3298	75.29	2.0569	15.00	+ 1.3343	11.6641	72.9006	298.892	85.00
		12.7571	79.7319	11.7723	92.29	1.2594	9.87	— 0.2746	11.4977	71.8606	294.628	90.13
		13.9125	86.9531	11.9784	86.10	2.3044	16.56	— 0.3703	11.6081	72.5506	297.457	83.44
Tanaka	*Idem*	13.3381	83.3631	10.2010	76.48	2.5675	19.24	+ 0.5696	10.7706	67.3163	275.997	80.76
		13.9133	86.9581	10.9995	79.06	1.9664	14.12	+ 0.9474	11.9469	74.6681	306.139	85.88
		13.3381	83.3631	10.4117	78.04	2.2436	16.82	+ 0.6828	11.0945	69.3506	284.337	83.18
Yasuda	*Idem*	12.9552	80.9700	10.5958	81.79	2.4824	19.16	— 0.1230	10.4728	65.4550	268.366	80.84
		12.7571	79.7319	11.2056	95.67	2.2454	17.60	— 0.6939	10.5117	65.6981	269.362	82.40
		14.1039	88.1494	11.4709	81.33	2.9417	20.07	— 0.3087	11.1622	69.7638	286.032	79.93

igestibility and Utilisation of the Carbohydrate (as Glucose) and its Caloric Value.

Sujets Subject	Période Period	Absorption des hydrates de carbone Moy. jour. (gr.) Carbohydrate intake Average per day (gms.)	Hydrates de carb. élim. dans les selles Moyenne journal. Carbohydrate in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
	Riz cuit . . .	415.91	1.6990	0.41	414.21	1698.261	99.59
	Boiled rice . .						
ugimoto	Dango . . .	425.00	1.1896	0.28	423.81	1737.621	99.72
	Riz cuit . . .	415.91	1.9634	0.74	413.95	1697.195	99.53
	Boiled rice . .						
		415.91	1.5404	0.37	414.37	1698.917	99.63
iguchi .	*Idem*	499.01	1.5357	0.30	497.47	2039.627	99.70
		430.95	2.3568	0.54	428.59	1757.219	99.46
		476.07	1.9274	0.41	474.14	1943.974	99.59
omoyeda	*Idem*	400.33	1.2047	0.30	399.13	1636.433	99.70
		491.11	2.3599	0.48	488.75	2003.875	99.52
		445.99	1.6048	0.36	444.39	1821.999	99.64
anaka .	*Idem*	499.01	1.1085	0.22	497.90	2041.390	99.78
		445.99	1.5858	0.35	444.40	1822.040	99.65
		415.91	2.0724	0.49	413.84	1696.744	99.51
asuda .	*Idem*	400.33	2.1808	0.54	398.15	1632.415	99.46
		506.15	3.3061	0.65	502.84	2061.644	99.35

Digestibility and Utilisation of Crude Fat and its Caloric Value.

Sujets Subject	Période Period	Absorption de la graisse Moy. jour. (gr.) Fat intake Average per day (gms.)	Graisse éliminée dans les selles Moyenne journal. Fat in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pour centag d'ab sorpti
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	% of ab sorpti
Sugimoto	Riz cuit . . . Boiled rice . .	19.38	2.6264	13.55	16.75	155.775	86.4
	Dango . . .	19.46	1.7973	9.23	17.66	163.238	90.7
	Riz cuit . . . Boiled rice . .	19.38	2.2111	11.41	17.17	159.681	88.5
Higuchi .	*Idem*	19.38	2.1714	11.20	17.21	60.056	88.8
		20.07	2.1532	10.73	17.92	66.656	89.2
		19.51	3.0898	15.83	16.42	152.706	84.1
Momoyeda	*Idem*	9.86	2.5394	12.77	17.34	161.262	87.2
		19.25	1.4090	7.32	17.84	165.912	92.6
		20.01	3.7155	18.57	16.29	151.497	81.4
Tanaka .	*Idem*	19.63	2.8753	14.65	16.76	155.868	85.3
		20.07	1.5152	7.55	18.56	172.608	92.4
		9.63	2.0371	10.38	17.59	163.587	89.6
Yasuda .	*Idem*	19.38	2.7898	14.39	16.59	154.287	85.6
		19.25	2.0143	10.62	17.21	160.053	89.3
		20.13	3.8933	14.37	16.24	151.032	85.6

Digestibility and Utilisation of Crude Ash.

Sujets Subject	Période Period	Absorption des cendres Moy. journ. (gr.) Ash intake Average per day (gms.)	Cendres éliminées dans les selles Moyenne journalière Ash in fæces Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	
Sugimoto .	Riz cuit	24.11	3.5720	14.82	85.18
	Boiled rice				
	Dango	24.44	2.8781	11.92	88.08
	Riz cuit	24.11	3.7289	15.47	81.53
	Boiled rice				
Higuchi . .	*Idem*	24.11	3.4334	14.24	85.76
		24.41	2.9393	12.04	87.96
		24.17	3.9907	16.51	83.49
Momoyeda	*Idem*	24.33	3.3371	13.31	86.69
		24.05	2.2300	9.27	90.73
		24.49	3.7037	15.18	84.82
Tanaka .	*Idem*	24.22	3.7689	15.56	84.44
		24.41	3.0318	12.42	87.58
		24.22	3.4868	14.39	85.61
Yasuda .	*Idem*	24.11	3.9732	16.48	83.52
		24.05	3.1001	14.13	85.87
		24.44	4.1702	17.06	82.94

Percentage of the Caloric Value of Food actually utilised by the Body.

Sujets Subject	Période Period	Absorption des calories Moyenne journalière Calories intake Average per day		Utilisation des calories Caloric utilisation		% de la quantité de calorie absorbée % agains calories intake
		Calories totales Total calories	Par kg. du poids Per kg. of body weight	Calories totales Total calories	Par kg. du poids Per kg. of body weight	
Sugimoto .	Riz cuit . . . . Boiled rice . . .	2217.442	36.44	2128.957	34.98	95.99
	Dango	2258.425	37.39	2182.091	36.12	96.60
	Riz cuit . . . . Boiled rice . . .	2217.442	36.84	2127.217	35.34	95.98
Higuchi .	*Idem*	2217.442	42.52	2127.613	40.80	95.95
		2589.110	49.80	2502.647	48.13	96.65
		2285.222	44.11	2176.379	42.01	95.34
Momoyeda	*Idem*	2488.377	42.64	2404.128	41.20	96.62
		2147.276	37.11	2096.973	36.25	97.68
		2556.151	44.20	2452.829	42.41	95.95
Tanaka .	*Idem*	2352.906	44.65	2253.864	42.77	95.81
		2589.110	49.05	2520.137	47.75	97.35
		2352.906	44.56	2269.964	42.99	96.47
Yasuda .	*Idem*	2217.442	34.30	2119.397	32.78	95.56
		2147.279	33.53	2061.830	32.20	96.03
		2623.836	41.00	2408.708	39.04	95.22

Percentage of Digestibility and Utilisation of Each Constituent.

Période Period	Azote total Total nitrogen %	Hydrates de carbone (comme le glycose) Carbo-hydrate as glucose %	Graisse brute Crude fat %	Cendres brutes Crude ash %	Calories %
Riz cuit — Boiled rice	82.066	99.592	86.688	85.188	95.986
Dango	85.102	99.672	90.910	88.044	96.862
Riz cuit — Boiled rice	81.416	99.502	85.888	84.278	95.762

onclusion.

1. The digestibility and utilisation of rice were better when "dango" was sed than when ordinary boiled rice was used. The same quantity of energy was applied in each case.

2. The output of total nitrogen in the urine was greater when "dango" was sed than when boiled rice was used, but the ratio of individual nitrogenous compounds to the total nitrogen in the urine was almost constant during each period.

3. The daily output of fæces (wet and dry) was smaller when "dango" was sed; the quantities of boiled rice and of "dango" eaten were nearly the same.

Experiment II.

omparison of the Digestibility and Utilisation of Boiled Polished Rice, "Dango" (made of Unpolished Rice), and Boiled Unpolished Rice.

The method of preparation of "dango" was the same as before, but in this periment we used the powder of unpolished rice instead of using polished-rice ur.

Daily Output of the Total Nitrogen and the Distribution of Nitrogenous Constituents in the Urine.

Sujets Subjects	Période Period	Date Mars-March	Azote total Total N.	Azote de l'urée Urea N.		Azote de NH^3 Ammonia N.		Azote de l'acide urique Uric acid N.		Azote des bases puriques Purin base N.		Azote des acides aminés Amino acid N.		Azote de la créatinine Creatinin N.		Azote de la créatine Creatin N.	
			(g)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
Yamamoto	Riz glacé cuit	7	9.3766	7.9518	84.81	0.4562	4.87	0.1940	2.07	0.0200	0.21	0.1516	1.62	0.4652	4.96	0.0109	0.12
	Boiled polished rice	8	9.2736	7.7535	83.61	0.5474	5.90	0.2114	2.28	0.0219	0.24	0.1690	1.82	0.4704	5.07	0.0113	0.12
		Moy-Aver	9.3251	7.8527	84.21	0.5018	5.38	0.2027	2.18	0.0210	0.23	0.1603	1.72	0.4678	5.02	0.0111	0.12
	Dango (non glacé)	9	10.0979	8.7310	86.47	0.4903	4.86	0.2189	2.17	0.0174	0.17	0.1799	1.78	0.4741	4.70	0.0276	0.27
		10	10.5060	7.8908	75.11	0.6159	5.86	0.1642	1.56	0.0180	0.17	0.1700	1.62	0.4596	4.38	0.0220	0.21
	Dango (unpol.)	Moy-Aver	10.3020	8.3109	80.79	0.5531	5.36	0.1916	1.87	0.0177	0.17	0.1750	1.70	0.4669	4.54	0.0248	0.24
	Riz n. glacé cuit	11	10.3040	8.6300	83.61	0.7299	7.08	0.1940	1.88	0.0206	0.20	0.1719	1.67	0.4596	4.46	0.0337	0.33
	Boiled unpol. rice	12	9.2736	7.3711	79.48	0.7527	8.12	0.2065	2.23	0.0264	0.28	0.1610	1.74	0.4527	4.88	0.0177	0.36
		Moy-Aver	9.7888	8.0006	81.55	0.7413	7.60	0.2003	2.06	0.0235	0.24	0.1665	1.71	0.4562	4.67	0.0257	0.35
Momoyeda	Boiled polished rice	7	11.4374	9.1270	79.81	0.9124	7.98	0.1890	1.65	0.0270	0.24	0.1516	1.33	0.5846	5.11	0.0116	0.10
		8	10.0979	8.1986	81.19	0.7071	7.00	0.1940	1.92	0.0232	0.23	0.1784	1.77	0.5903	5.86	0.0178	0.18
	Riz glacé cuit	Moy-Aver	10.7677	8.6628	80.50	0.8098	7.49	0.1915	1.79	0.0251	0.24	0.1650	1.55	0.5875	5.49	0.0147	0.14
	Dango (non glacé)	9	11.0252	8.2000	74.38	0.6957	6.31	0.1990	1.80	0.0290	0.26	0.1847	1.68	0.5789	5.26	0.0113	0.12
		10	13.2921	10.5899	79.67	0.7755	5.84	0.1865	1.40	0.0245	0.18	0.1795	1.35	0.5575	4.19	0.0159	0.12
	Dango (unpol.)	Moy-Aver	12.1587	9.3950	77.03	0.7356	6.08	0.1928	1.60	0.0268	0.22	0.1821	1.52	0.5682	4.73	0.0136	0.12
	Riz n. glacé cuit	11	11.0768	9.1822	82.90	0.7641	6.90	0.2138	1.93	0.0238	0.21	0.1673	1.51	0.5734	5.18	0.0168	0.15
	Boiled unpol. rice	12	9.9425	7.6790	77.23	0.8440	8.49	0.2065	2.08	0.0303	0.30	0.1704	1.71	0.5484	5.52	0.0101	0.10
		Moy-Aver	10.5097	8.4306	80.07	0.8041	7.70	0.2102	2.01	0.0271	0.26	0.1689	1.61	0.5609	5.35	0.0135	0.13
Tanaka	Riz glacé cuit	7	10.5616	8.1384	77.06	0.6159	5.83	0.2164	2.05	0.0245	0.23	0.1659	1.57	0.4856	4.60	0.0379	0.36
	Boiled polished rice	8	11.1283	9.4126	84.58	0.5930	5.33	0.1816	1.63	0.0290	0.26	0.1643	1.48	0.5018	4.51	0.0409	0.37
		Moy-Aver	10.8450	8.1930	80.82	0.6045	5.58	0.1990	1.84	0.0268	0.25	0.1651	1.53	0.4937	4.56	0.0394	0.37
	Dango (non glacé)	9	11.6435	9.5479	82.00	0.6501	5.58	0.1990	1.71	0.0187	0.16	0.1604	1.39	0.5103	4.38	0.0472	0.41
		10	12.7769	9.7286	76.14	0.6159	4.82	0.2189	1.71	0.0232	0.18	0.1747	1.37	0.5018	3.93	0.0716	0.56
	Dango (unpol.)	Moy-Aver	12.2102	9.6383	79.07	0.6330	5.20	0.2090	1.71	0.0210	0.17	0.1676	1.38	0.5061	4.16	0.0594	0.49

(Continuation).

Sujets Subjects	Période Period	Date Mars-March	Azote total Total N.	Azote de l'urée Urea N.		Azote de NH^3 Ammonia N.		Azote de l'acide urique Uric acid N.		Azote des bases puriques Purin base N.		Azote des acides aminés Amino acid N.		Azote de la créatinine Creatinin N.		Azote de la créatine Creatin N.	
			(g)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
Tanaka	Riz n. glacé cuit	11	10.1072	8.2001	81.14	0.5816	5.75	0.1915	1.89	0.0290	0.29	0.1766	1.75	0.5103	5.05	0.0687	0.68
	Boiled unpol.	12	11.6950	10.0196	85.67	0.6159	5.27	0.2338	2.00	0.0270	0.23	0.1704	1.46	0.5191	4.44	0.0544	0.47
	rice	Moy-Aver	10.9011	9.1099	83.41	0.5988	5.51	0.2127	1.95	0.0280	0.26	0.1735	1.61	0.5147	4.75	0.0626	0.58
Ishibashi	Riz glacé cuit	7	10.5101	8.6676	82.46	0.6843	6.51	0.2040	1.94	0.0258	0.25	0.1611	1.53	0.4817	4.58	0.0508	0.48
	Boiled polished	8	10.0464	8.3949	83.56	0.6501	6.47	0.1567	1.56	0.0245	0.24	0.1878	1.87	0.4460	4.44	0.0172	0.17
	rice	Moy-Aver	10.2283	8.5293	83.01	0.6672	6.49	0.1804	1.75	0.0252	0.25	1.1745	1.70	0.4639	4.51	0.0340	0.33
	Dango (non	9	11.8800	9.8005	82.49	0.8440	7.10	0.2338	1.97	0.0219	0.18	0.1799	1.51	0.4704	3.96	0.0442	0.37
	glacé)	10	11.7264	8.7018	74.21	0.8782	7.49	0.2088	1.78	0.0206	0.17	0.1795	1.53	0.4652	3.96	0.0302	0.25
	Dango (unpol.)	Moy-Aver	11.8032	9.2512	78.35	0.8611	7.30	0.2213	1.88	0.0213	0.18	0.1797	1.52	0.4678	3.96	0.0372	0.31
	Riz n. glacé cuit	11	11.3648	9.1353	80.38	0.7299	6.42	0.1989	1.75	0.0251	0.22	0.1859	1.63	0.4934	4.34	0.0348	0.31
	Boiled unpol.	12	10.0252	8.2126	81.92	0.9352	9.33	0.2089	2.08	0.0270	0.27	0.1610	1.61	0.4976	4.96	0.0497	0.49
	rice	Moy-Aver	10.6950	8.6740	81.15	0.8326	7.38	0.2039	1.92	0.0261	0.25	0.1735	1.62	0.4955	4.65	0.0423	0.40
Kayano	Riz glacé cuit	7	9.8918	7.6816	77.65	0.6273	6.34	0.2139	2.16	0.0251	0.25	0.1564	1.59	0.4301	4.35	0.0094	0.09
	Boiled polished	8	9.6342	7.7844	80.79	0.5930	6.15	0.1443	1.49	0.0232	0.24	0.1549	1.61	0.4395	4.56	0.0099	0.13
	rice	Moy-Aver	9.7630	7.7330	79.22	0.6102	6.25	0.1791	1.83	0.0242	0.25	0.1557	1.60	0.4348	4.46	0.0097	0.11
	Dango (non	9	10.0768	7.8735	78.13	0.4903	4.96	0.2462	2.44	0.0238	0.23	0.1657	1.64	0.4527	4.49	0.0141	0.14
	glacé)	10	12.5708	9.3543	74.41	0.6045	4.81	0.1940	1.54	0.0245	0.19	0.1747	1.39	0.4527	3.60	0.0069	0.05
	Dango (unpol.)	Moy-Aver	11.3238	8.6138	76.27	0.5974	4.89	0.2201	1.99	0.0242	0.21	0.1702	1.52	0.4527	4.05	0.0105	0.10
	Riz n. glacé cuit	11	10.5101	8.9641	85.29	0.6159	5.86	0.1866	1.77	0.0245	0.23	0.1766	1.68	0.4596	4.37	0.0107	0.10
	Boiled unpol.	12	10.0979	8.0688	79.90	0.6957	6.88	0.2065	2.04	0.0232	0.23	0.1562	1.54	0.4527	4.48	0.0105	0.10
	rice	Moy-Aver	10.3040	8.5165	82.60	0.6558	6.37	0.1966	1.91	0.0239	0.23	0.1664	1.61	0.4562	4.43	0.0106	0.10

Daily Output of SO_3, P_2O_5, and NaCl in the Urine.

Période Period	Date	Yamamoto			Momoyeda		
		SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	Na
Riz glacé cuit	Mars-Mar. 7	1.6650	1.2390	17.5	1.9488	1.5045	2
Boiled polished rice	8	1.6252	1.9824	18.5	1.5850	1.3279	1
	Moyenne —Aver.	1.6452	1.6107	18.0	1.7669	1.4162	2
Dango non glacé	9	1.6148	1.8054	17.4	1.8268	1.8585	1
Dango unpolished	10	1.8505	1.8408	17.9	2.1418	2.2302	1
	Moyenne —Aver.	1.7327	1.8231	17.7	1.9843	2.0444	1
Riz non glacé cuit	11	1.9580	1.9647	19.4	1.8838	1.8408	1
Boiled unpol. rice	12	1.4524	2.0355	19.3	1.9332	2.1063	1
	Moyenne —Aver.	1.7052	2.0001	19.4	1.9085	1.9736	1

Période Period	Date	Tanaka			Ishibashi			Kayano		
		SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	N
Riz glacé cuit	Mars-Mar. 7	1.9366	1.5399	20.2	1.8310	1.2052	19.3	1.6938	1.0620	
Boiled polished rice	8	1.8832	1.6993	18.2	1.7338	1.6461	15.2	1.6868	1.4868	
	Moyenne —Aver.	1.9099	1.6196	19.2	1.7824	1.4257	17.3	1.6903	1.2744	
Dango non glacé	9	2.1348	2.0709	17.7	2.0890	1.9116	18.1	1.7288	2.1594	
Dango unpolished	10	2.0882	2.1063	17.3	2.0080	2.2656	16.8	2.2324	1.9293	
	Moyenne —Aver.	2.1115	2.0886	17.5	2.0485	2.0886	17.5	1.9806	2.0444	
Riz non glacé cuit	11	2.0088	1.9470	19.8	2.0328	1.8939	21.4	1.7004	1.7877	
Boiled unpol. rice	12	2.0286	1.9647	21.2	1.6146	2.0001	18.2	1.7200	1.9824	
	Moyenne —Aver.	2.0187	1.9559	20.5	1.8237	1.9420	19.8	1.7102	1.8851	

Sujets Subject	Période Period	Absorption d'azote Moyenne journalière N. intake Average per day Azote (gr.) Nitrogen (gms.)	 Protéine (gr.) Protein (gms.)	Azote trouvé dans l'urine Moyenne journalière N. in urine Average per day Quantité (gr.) Quantity (gms.)	 % de la quantité absorbée % against intake	Azote trouvé dans les selles Moyenne journalière N. in fæces Average per day Quantité (gr.) Quantity (gms.)	 % de la quantité absorbée % against intake	Gains ou pertes en azote Nitrogen balance	Absorption Moyenne journalière Absorption Average per day Azote (gr.) Nitrogen (gms.)	 Protéine (gr.) Protein (gms.)	 Calories	Pourcentage d'absorption % of absorption
Yamamoto .	Riz glacé cuit Boiled pol. rice	12.1894	76.1838	9.3251	76.50	1.9741	16.19	+ 0.8902	10.2153	63.8456	261.767	83.81
	Dango non glacé Dango unpol.	14.5044	90.6525	10.3020	71.02	2.8680	19.77	+ 1.3344	11.6364	72.7275	298.183	80.23
	Riz non glacé cuit Boiled unpol. rice	14.1214	88.2588	9.7888	69.32	3.1558	22.34	+ 1.1768	10.9656	68.5350	280.994	77.66
Momoyeda	*Idem*	13.3381	83.3631	10.7677	80.73	1.7247	12.93	+ 0.8457	11.6134	72.5838	297.594	87.07
		15.5284	97.0525	12.1587	78.30	2.3205	14.94	+ 1.0492	13.2079	82.5494	338.453	85.06
		14.1214	88.2588	10.5097	74.42	2.7442	19.44	+ 0.9675	11.3772	71.1075	291.541	80.56
Tanaka . .	*Idem*	13.1467	82.1669	10.8450	82.49	1.9291	14.67	+ 0.3726	11.2176	70.1100	287.451	85.33
		15.0164	93.8525	12.2102	81.31	2.3332	17.95	+ 0.4730	12.6832	79.2900	225.007	84.47
		13.5453	84.6581	10.9011	80.47	2.6522	24.15	— 0.0080	10.8931	68.0819	279.136	80.36
Ishibashi .	*Idem*	12.1894	76.1838	10.2283	83.91	1.5347	12.59	+ 0.4264	10.6547	66.5919	273.027	87.41
		14.5044	90.6525	11.8032	81.37	2.6045	17.95	+ 0.0967	11.8999	74.3744	304.935	82.05
		12.3931	77.4569	10.6950	86.30	2.9933	24.15	— 1.2952	9.3998	58.7488	240.870	75.85
Kayano . .	*Idem*	12.5723	78.5769	9.7630	77.65	1.3447	10.70	+ 1.4646	11.2276	70.1725	287.707	89.30
		14.5044	90.6525	11.3238	78.07	2.4629	16.98	+ 0.7177	12.0415	75.2594	308.563	83.02
		14.1214	88.2588	10.3040	72.96	3.0376	21.51	+ 0.7798	11.0838	69.2738	284.023	78.49

Digestibility and Utilisation of the Carbohydrate (as Glucose) and its Caloric Valu

Sujets Subject	Période Period	Absorption des hydrates de carbone Moy. jour. (gr.) Carbohydrate intake Average per day (gms.)	Hydrates de carb. élim. dans les selles Moyenne journal. Carbohydrate in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pour centa d'ab sorpti % of ab sorpti
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
Yamamoto	Riz glacé cuit Boiled pol. rice	355.75	1.9938	0.56	353.76	1450.416	99.4
	Dango non glacé Dango unpol.	334.25	3.8137	1.14	330.44	1354.804	98.8
	Riz non glacé cuit . . . . Boiled unpol. rice	316.35	4.1783	1.32	312.17	1279.897	98.6
Momoyeda	*Idem*	445.99	1.8963	0.42	444.09	1820.769	99.5
		380.80	3.0753	0.81	377.72	1548.652	99.1
		316.35	3.9105	1.23	312.44	1281.004	98.7
Tanaka .	*Idem*	430.95	1.6259	0.38	429.32	1760.212	99.6
		357.53	3.1296	0.87	354.40	1453.040	99.1
		290.21	3.8819	1.33	286.33	1173.953	98.6
Ishibashi.	*Idem*	355.75	0.9990	0.28	354.75	1454.475	99.7
		334.25	3.4692	1.03	330.78	1356.198	98.9
		237.93	5.3486	2.24	232.58	953.578	97.7
Kayano .	*Idem*	385.83	1.5233	0.40	384.35	1575.835	99.6
		334.25	3.5262	1.04	330.72	1355.952	98.9
		316.35	4.5853	1.45	311.76	1278.216	98.5

Digestibility and Utilisation of Crude Fat and its Caloric Value.

Sujets Subject	Période Period	Absorption de la graisse Moy. jour. (gr.) Fat intake Average per day (gms.)	Graisse éliminée dans les selles Moyenne journal. Fat in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
	Riz glacé cuit Boiled pol. rice	18.88	2.4007	12.71	16.48	153.264	87.29
mamoto	Dango non glacé Dango unpol.	25.50	2.5993	10.19	22.90	212.970	89.81
	Riznon glacé cuit Boil. unpol. rice	24.98	9.9127	39.69	15.07	140.151	60.31
moyeda	*Idem*	19.63	2.2938	11.68	17.34	161.262	88.32
		27.02	2.7859	10.31	24.23	225.339	89.68
		24.98	8.4095	33.66	16.57	154.101	66.34
naka .	*Idem*	19.51	2.3787	12.18	17.12	159.216	87.82
		26.26	2.6790	10.20	23.58	218.299	89.80
		24.12	8.7812	36.40	15.34	142.662	63.60
ibashi.	*Idem*	18.88	1.9232	10.19	16.96	157.728	89.81
		25.50	3.2484	12.73	22.25	206.925	87.27
		22.40	8.8900	39.68	13.51	125.643	60.32
yano .	*Idem*	19.13	1.8817	9.83	17.25	160.425	90.17
		25.50	3.5383	13.87	21.96	204.228	86.13
		24.98	10.3203	41.31	14.66	136.338	58.69

Digestibility and Utilisation of Crude Ash.

Sujets Subject	Période Period	Absorption des cendres Moy. journ. (gr.) Ash intake Average per day (gms.)	Cendres éliminées dans les selles Moyenne journalière Ash in fæces Average per day		Pourcent d'absorptio % of absorpti
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	
Yamamoto	Riz glacé cuit . . . . Boiled polished rice . .	23.89	2.9280	12.25	87.75
	Dango non glacé . . . Dango unpolished . .	26.27	6.3575	24.20	75.80
	Riz non glacé cuit . . Boiled unpolished rice	25.89	7.1039	27.44	72.56
Momoyeda	*Idem*	24.22	3.1075	12.83	87.17
		26.85	6.4719	24.10	75.90
		25.89	7.0474	27.22	72.78
Tanaka .	*Idem*	24.17	3.2722	13.53	86.47
		26.54	6.1777	23.28	76.72
		25.58	8.5848	33.55	66.45
Ishibashi .	*Idem*	23.89	2.8271	11.41	88.59
		26.27	6.4465	24.54	75.45
		24.96	7.1252	28.54	71.46
Kayano. .	*Idem*	24.01	2.3850	9.93	90.07
		26.27	6.1104	23.26	76.74
		25.89	6.6249	25.59	74.41

Percentage of the Caloric Value of Food actually utilised by the Body.

Sujets Subject	Période Period	Absorption des calories Moyenne journalière Calories intake Average per day		Utilisation des calories Calories utilisation		% de la quantité de calories absorbées % against calories intake
		Calories totales Total calories	Par kg. du poids Per kg. of body weight	Calories totales Total calories	Par kg. du poids Per kg. of body weight	
mamoto	Riz glacé cuit. . Boiled pol. rice .	1946.512	41.68	1865.447	39.94	95.82
	Dango non glacé Dango unpol. . .	1979.250	43.03	1865.957	40.56	94.26
	Riz non glacé cuit Boiled unpol. rice	1893.210	41.33	1701.042	37.14	89.86
moyeda	*Idem*	2352.906	40.90	2279.625	39.62	96.87
		2210.481	38.78	2112.444	37.06	95.56
		1893.210	33.31	1726.646	30.38	91.20
naka .	*Idem*	2285.222	43.44	2206.879	41.96	96.59
		2094.886	39.82	1997.346	38.01	95.45
		1761.275	33.74	1595.751	30.56	90.57
ibashi .	*Idem*	1946.512	39.22	1885.230	37.98	96.83
		1979.250	39.94	1868.058	37.70	94.39
		1501.997	30.72	1320.091	27.01	87.92
yano .	*Idem*	2081.997	43.44	2023.967	42.22	97.19
		1979.250	41.55	1868.743	39.23	94.41
		1893.210	39.67	1698.577	35.61	89.77

Digestibility and Utilisation of Each Constituent.

Période Period	Azote total Total nitrogen %	Hydrates de carbone (comme le glycose) Carbo-hydrate as glucose %	Graisse brute Crude fat %	Cendres brutes Crude ash %	Calori %
Riz glacé cuit . . . . Boiled polished rice . .	86.584	99.592	88.682	88.010	96.6(
Dango non glacé cuit . Dango unpolished . .	82.566	99.022	88.538	76.122	94.81
Riz non glacé cuit . . Boiled unpolished rice.	78.584	98.486	61.852	71.532	89.8(

Conclusion.

1. The digestibility and utilisation of each constituent of the unpolished were better when " dango " was used than when boiled unpolished rice was u boiled polished rice was better in this respect than either of the others. The s quantity of energy was supplied in each case.

2. When similar side dishes were eaten, we found that more " dango " n of unpolished rice was consumed than boiled unpolished rice (if the " dango " the boiled unpolished rice were both reckoned in terms of uncooked rice). amount of boiled polished rice consumed was the largest of all.

3. The nitrogenous compounds in the urine showed no appreciable differ in any of the periods except in the case of the urea nitrogen; the ratio of urea nitr to total urine nitrogen decreased slightly during the " dango " period.

4. The output of fæces was greatest when boiled unpolished rice was u was smaller during the " dango " period, and was smallest during the boiled polis rice period. The output of the various constituents in the fæces remained unchan

Experiment III.

Comparison of the Digestibility and Utilisation of Rice Gruel (Stewed Rice or " Kayu and Ordinary Boiled Rice.

For the preparation of " stewed rice " 424 gms. of polished rice were was and cooked in a mixture of 8 gms. of NaCl with 3,000 cc. of water. When the mixt began to boil 2,000 cc. of water were added; we obtained an average of 4,985 g of " stewed rice ".

Sujet Subject	Période Period	Date	Azote total Total N. (g)	Urea N. (g)	Urea N. (%)	NH_3 Ammonia N. (g)	NH_3 Ammonia N. (%)	Azote de l'acide urique Uric acid N. (g)	Azote de l'acide urique Uric acid N. (%)	Azote des bases puriques Purin base N. (g)	Azote des bases puriques Purin base N. (%)	Azote des acides aminés Amino acid N. (g)	Azote des acides aminés Amino acid N. (%)	Azote de la créatinine Creatinin N. (g)	Azote de la créatinine Creatinin N. (%)	Azote de la créatine Creatin N. (g)	Azote de la créatine Creatin N. (%
Higuchi	Riz cuit Boiled rice	Avril 26	10.3794	8.7950	84.73	0.8440	8.13	0.1700	1.64	0.0238	0.23	0.1579	1.52	0.5018	4.83	0.0129	0.12
		April 27	10.7596	8.8107	81.89	0.5132	4.77	0.1325	1.22	0.0228	0.21	0.1634	1.52	0.5680	5.28	0.0109	0.10
		Moy-Aver	10.5695	8.8029	83.31	0.6786	6.45	0.1513	1.43	0.0233	0.22	0.1607	1.52	0.5349	5.06	0.0119	0.11
	Gruau de riz Rice gruel	Avril 28	12.6264	10.0244	79.39	0.9083	7.11	0.1836	1.45	0.0235	0.19	0.1607	1.27	0.5720	4.53	0.0155	0.12
		April 29	10.6836	8.9604	83.87	0.9466	8.86	0.1400	1.31	0.0280	0.17	0.1785	1.67	0.5326	4.98	0.0149	0.14
		Moy-Aver	11.6550	9.4924	81.63	0.9275	7.99	0.1618	1.38	0.0258	0.18	0.1696	1.47	0.5523	4.76	0.0152	0.13
	Riz cuit Boiled rice	April 30	11.0638	9.4418	85.34	1.0264	9.27	0.1625	1.47	0.0209	0 19	0.1794	1.62	0.5628	5.08	0.0107	0.09
		Mai-May1	11.4440	9.5384	83.35	1.0150	8.87	0.1950	1.70	0.0228	0.19	0.1840	1.60	0.5735	5.01	0.0112	0.09
		Moy-Aver	11.2539	9.4902	84.35	1.0207	9.07	0.1788	1.59	0.0219	0.19	0.1817	1.61	0.5682	5.05	0.0110	0.09
Momoyeda	Riz cuit Boiled rice	Avril 26	10.7596	8.3637	77.73	0.6385	5.93	0.1450	1.35	0.0228	0.21	0.1634	1 52	0.6022	5.60	0.0123	0.11
		April 27	10.4174	8.2117	78.82	0.6159	5.91	0.1800	1.72	0.0219	0.20	0.1679	1.61	0.5846	5.61	0.0115	0.11
		Moy-Aver	10.5885	8.2877	78.28	0.6272	5.92	0.1625	1.54	0.0224	0.21	0.1657	1.57	0.5934	5.61	0.0119	0.11
	Gruau de riz Rice gruel	Avril 28	10.9497	8.4282	76.97	0.8782	8.02	0.1950	1.78	0.0276	0.26	0.1785	1.62	0.6144	5.61	0.0129	0.11
		April 29	11.0258	9.0139	81.75	0.9580	8.68	0.1650	1.49	0.0304	0.27	0.1994	1.80	0.6207	5.63	0.0131	0.11
		Moy-Aver	10.9878	8.7211	79.36	0.9181	8.35	0.1800	1.64	0.0290	0.27	0.1890	1.71	0.6176	5.62	0.0130	0.11
	Riz cuit Boiled rice	April 30	10.9497	9.0904	83.02	1.0721	9.79	0.1850	1.69	0.0295	0.27	0.1748	1.59	0.6022	5.50	0.0186	0.17
		Mai-May1	10.8737	8.9689	82.48	1.0721	9.86	0.1825	1.67	0.0276	0.26	0.1794	1.65	0.6022	5.54	0.0123	0.11
		Moy-Aver	10.9116	9.0297	82.75	1.0721	9.83	0.1838	1.68	0.0286	0.27	0.1771	1.62	0.6022	5.52	0.0155	0.14
Tanaka	Riz cuit Boiled rice	Avril 26	11.2539	9.6653	85.88	0.5792	5.14	0.1825	1.62	0.0266	0.23	0.2270	2.01	0.5236	4.66	0.0786	0.69
		April 27	11.4060	8.8771	77.82	0.5360	4.70	0.1525	1.34	0.0171	0.15	0.2147	1.88	0.5474	4.79	0.0670	0.58
		Moy-Aver	11.3300	9.2712	81.85	0.5576	4.92	0.1675	1.48	0.0219	0.19	0.2209	1.95	0.5355	4.73	0.0728	0.64
	Gruau de riz Rice gruel	Avril 28	11.4820	8.8332	76.93	0.6957	6.06	0.2150	1.87	0.0228	0.19	0.1830	1.59	0.5576	4.94	0.0966	0.84
		April 29	11.1791	8.8345	79.02	0.6957	6.22	0.1925	1.72	0.0352	0.31	0.1562	1.39	0.5326	4.76	0.0696	0.62
		Moy-Aver	11.3256	8.8339	77.98	0.6957	6.14	0.2038	1.80	0.0290	0.25	0.1696	1.49	0.5451	4.85	0.0834	0.73
	Riz cuit Boiled rice	April 30	10.9877	9.3874	85.43	0.8211	7.47	0.2275	2.07	0.0219	0.20	0.1840	1.67	0.5735	5.22	0.0639	0.58
		Mai-May1	10.7216	8.6107	80.31	0.9580	8.93	0.2075	1.93	0.0285	0.26	0.1886	1.76	0.5576	5.20	0.0569	0.53
		Moy-Aver	10.8547	8.9991	82.87	0.8896	8.20	0.2175	2.00	0.0252	0.23	0.1863	1.72	0.5656	5.21	0.0604	0.56

The Daily Output of SO_3, P_2O_5, and NaCl in the Urine.

Période Period	Date	Higuchi			Momoyeda			Tanaka	
		SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)
Riz cuit Boiled rice	Av.-Apr. 26	1.7597	1.9449	21.0	1.9450	1.4678	20.0	2.0582	1.7247
	27	1.9230	2.0709	16.0	1.8791	1.6513	17.3	2.0843	1.9999
	Moyenne —Aver.	1.8414	2.0079	18.5	1.9121	1.5596	18.7	2.0713	1.8623
Gruau de riz Rice gruel	28	2.0768	1.8128	29.0	1.8654	1.7431	20.5	2.0441	1.7431
	29	2.0910	1.4495	19.7	1.9120	1.5779	21.1	1.9676	1.7431
	Moyenne —Aver.	2.0839	1.6312	24.4	1.8887	1.6605	20.8	2.0058	1.7431
Riz cuit Boiled rice	30 Mai-May	1.9477	1.6697	17.8	1.9634	1.9999	17.5	2.0588	1.9082
	1	1.8956	1.7798	18.4	1.8386	1.8531	19.1	1.9240	1.6697
	Moyenne —Aver.	1.9217	1.7248	18.1	1.9010	1.9265	18.3	1.9914	1.7890

Sujets / Subject	Période / Period	Absorption d'azote Moyenne journalière — N. intake Average per day: Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Azote trouvé dans l'urine Moyenne journalière — N. in urine Average per day: Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Azote trouvé dans les selles Moyenne journalière — N. in fæces Average per day: Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Gains ou pertes en azote Nitrogen balance	Absorption Moyenne journalière — Absorption Average per day: Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Calories	Pourcentage d'absorption % of absorption
Higuchi . .	Riz cuit . . . . Boiled rice . . .	13.7172	85.7325	10.5695	77.05	1.8217	13.28	+ 1.3260	11.8955	74.3469	304.822	86.72
	Gruau de riz . . Rice gruel . . .	9.6468	60.2925	11.6550	120.81	1.5212	15.77	— 3.5294	8.1256	50.7850	208.219	84.23
	Riz cuit . . . . Boiled rice . . .	14.1636	88.5225	11.2539	79.45	1.8254	12.88	+ 1.0843	12.3382	77.1138	316.167	87.12
Momoyeda	*Idem*	13.9404	87.1275	10.5885	75.95	2.3013	16.65	+ 1.0706	11.6391	72.7444	298.252	83.35
		9.6468	60.2925	10.9878	113.90	1.7770	18.42	— 3.1180	7.8698	49.1863	201.664	81.58
		13.9404	87.1275	10.9116	78.21	1.8290	13.12	+ 1 1998	12.1114	75.6973	310.359	86.88
Tanaka . .	*Idem*	14.1636	88.5225	11.3300	79.99	2.8416	20.06	— 0.0080	11.3220	70.7625	290.126	79.94
		9.6870	60.5438	11.3256	116.88	2.3205	23.95	— 3.9591	7.3665	46.0406	188.766	76.06
		14.3868	89.9175	10.8547	75.44	2.4084	16.74	+ 1.1123	11.9784	74.8650	304.947	83.26

Digestibility and Utilisation of the Carbohydrate (as Glucose) and its Caloric Valu

Sujets / Subject	Période / Period	Absorption des hydrates de carbone Moy. jour. (gr.) Carbohydrate intake Average per day (gms.)	Hydrates de carb. élim. dans les selles Moyenne journal. Carbohydrate in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pou cent d'a sorp % of a sorp
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
Higuchi .	Riz cuit . . . Boiled rice . .	475.79	1.0958	0.23	474.69	1946.229	99.
	Gruau de riz . Rice gruel . .	156.07	0.9881	0.63	155.08	635.828	99.
	Riz cuit . . . Boiled rice . .	510.86	1.0532	0.21	509.81	2090.221	99.
Momoyeda	*Idem*	483.33	1.6790	0.34	481.65	1974.765	99.
		156.07	1.3245	0.84	154.75	634.475	99.
		483.33	1.1485	0.24	482.18	1976.938	99.
Tanaka .	*Idem*	510.86	1.5145	0.29	509.35	2088.335	99.
		159.23	1.4420	0.90	157.79	646.939	99.
		528.40	1.3203	0.24	527.08	2161.028	99.

Digestibility and Utilisation of Crude Fat and its Caloric Value.

Sujets / Subject	Période / Period	Absorption de la graisse Moy. jour. (gr.) Fat intake Average per day (gms.)	Graisse éliminée dans les selles Moyenne journal. Fat in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pou centa d'al sorpti % of a sorpti
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
Higuchi .	Riz cuit . . . Boiled rice . .	19.74	1.8598	9.42	17.88	166.284	90.5
	Gruau de riz . Rice gruel . .	17.18	1.4848	8.64	15.70	146.010	91.3
	Riz cuit . . . Boiled rice . .	20.02	1.6414	8.19	18.38	170.934	91.8
Momoyeda	*Idem*	19.88	2.2727	11.43	17.61	163.773	88.5
		17.18	1.3546	7.88	15.83	147.219	92.1
		19.88	1.5026	7.55	18.38	170.934	92.4
Tanaka	*Idem*	20.02	2.7287	13.63	17.29	160.797	86.3
		17.21	1.8624	10.82	15.35	142.755	89.1
		20.16	1.8730	9.29	18.29	170.094	90.7

Digestibility and Utilisation of Crude Ash.

Sujets / Subject	Période / Period	Absorption des cendres Moy. journ. (gr.) Ash intake Average per day (gms.)	Cendres éliminées dans les selles Moyenne journalière Ash in fæces Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	
iguchi .	Riz cuit	24.35	2.9004	11.91	88.09
	Boiled rice				
	Gruau de riz	23.11	2.6953	11.66	88.34
	Rice gruel				
	Riz cuit	24.48	2.9975	12.24	87.76
	Boiled rice				
omoyeda	*Idem*	24.42	3.2261	13.21	86.79
		23.11	2.5785	11.16	88.84
		24.42	2.7722	11.35	88.65
naka .	*Idem*	24.48	4.1729	17.04	82.96
		23.12	3.0985	13.40	86.60
		24.55	3.8437	15.65	84.35

Percentage of the Caloric Value of Food actually utilised by the Body.

Sujets / Subject	Période / Period	Absorption des calories Moyenne journalière Calories intake Average per day		Utilisation des calories Calories utilisation		% de la quantité de calories absorbée % against calories intake
		Calories totales Total calories	Par kg. du poids Per kg. of body weight	Calories totales Total calories	Par kg. du poids Per kg. of body weight	
guchi .	Riz cuit	2485.824	47.59	2417.335	46.28	97.24
	Boiled rice . . .					
	Gruau de riz . .	1046.860	20.40	990.057	19.30	94.61
	Rice gruel . . .					
	Riz cuit	2613.654	51.28	2577.322	49.99	97.60
	Boiled rice . . .					
moyeda	*Idem*	2564.760	44.88	2436.790	42.64	95.23
		1046.860	18.40	983.358	17.28	93.48
		2564.760	45.43	2458.231	43.54	95.84
naka .	*Idem*	2643.654	49.47	2539.258	47.77	96.56
		1061.125	20.02	978.460	18.46	92.21
		2722.590	51.37	2636.069	49.74	96.82

Digestibility and Utilisation of Each Constituent.

Période Period	Azote total Total nitrogen %	Hydrates de carbone (comme le glycose) Carbo-hydrate as glucose %	Graisse brute Crude fat %	Cendres brutes Crude ash %	Calorie %
Riz cuit — Boiled rice	83.337	99.713	88.507	85.947	96.34
Gruau de riz—Rice gruel	80.620	99.207	90.887	87.927	93.43
Riz cuit — Boiled rice	85.753	99.770	91.657	86.920	96.75

Conclusion.

1. The digestibility and utilisation of total nitrogen, carbohydrates and cr fat were better when ordinary boiled rice was used than when stewed rice was u but in the case of crude ash, they were worse. The quantity of energy supplied greater during the boiled rice period.

2. When similar side dishes were eaten, we found that more stewed rice eaten than boiled rice; but if we compared the amounts in terms of uncooked we found the real quantity of stewed rice was much smaller than that of boiled r The required amount of energy could not be supplied by the stewed rice.

3. The daily amounts of urine increased remarkably during the stewed period; two specimens showed an alkaline reaction.

4. The ratio of urea nitrogen to total urine nitrogen was less during the ste rice period.

5. The output of fæces was the same in each period.

Experiment IV.

Comparison of the Digestibility and Utilisation of "Ojiya" and Ordinary Boiled Rice.

For the preparation of " Ojiya ", 963 gms. of polished rice were washed boiled with 4,000 cc. of water. When the boiling-point was reached, 80 gms. " miso " were added and the mixture was then cooked. We obtained 3,860 g of " Ojiya ".

Sujets Subjects	Période Period	Date	Azote total Total N.	Azote de l'urée Urea N.		Azote de NH^3 Ammonia N.		Azote de l'acide urique Uric acid N.		Azote des bases puriques Purin base N.		Azote des acides aminés Amino acid N.		Azote de la créatinine Creatinin N.		Azote de la créatine Creatin N.	
		Mai-May	(g)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
Kayano	Riz cuit Boiled rice	24	9.9709	8.2046	82.39	0.8326	8.35	0.1959	1.87	0.0289	0.29	0.1536	1.54	0.5236	5.25	0.0090	0.09
		25	10.2463	8.5276	83.23	0.5474	5.34	0.2020	1.97	0.0268	0.26	0.2276	2.22	0.5326	5.20	0.0101	0.10
		Moy-Aver	10.1086	8.3661	82.81	0.6900	6.85	0.1989	1.92	0.0279	0.28	0.1906	1.88	0.5281	5.23	0.0095	0.10
	Ojiya	26	10.1361	8.1768	80.68	0.4676	4.61	0.1803	1.78	0.0325	0.32	0.1461	1.44	0.5730	5.24	0.0142	0.14
		27	10.7013	8.5066	79.49	0.6159	5.76	0.2201	2.05	0.0296	0.28	0.1405	1.31	0.5190	4.85	0.0135	0.13
		Moy-Aver	10.4187	8.3417	80.08	0.5417	5.19	0.2002	1.91	0.0310	0.30	0.1433	1.37	0.5460	5.04	0.0138	0.14
Imai	Riz cuit Boiled rice	28	10.2463	8.5631	83.51	0.6159	6.01	0.2223	2.17	0.0324	0.32	0.1737	1.69	0.5236	5.13	0.0140	0.14
		29	10.0259	7.8123	77.92	0.6501	6.48	0.2050	2.04	0.0234	0.23	0.1618	1.61	0.5282	5.27	0.0095	0.09
		Moy-Aver	10.1361	8.1877	80.71	0.6330	6.25	0.2136	2.11	0.0279	0.28	0.1677	1.65	0.5259	5.20	0.0117	0.12
	Riz cuit Boiled rice	24	11.6786	8.9921	76.99	0.9580	8.20	0.2050	1.76	0.0324	0.28	0.1707	1.46	0.5282	4.52	0.0095	0.08
		25	10.0811	8.4897	84.21	0.5588	5.54	0.1868	1.85	0.0296	0.29	0.1650	1.64	0.5190	5.14	0.0135	0.13
		Moy-Aver	10.8799	8.7409	80.60	0.7584	6.87	0.2959	1.81	0.0310	0.29	0.1679	1.55	0.5236	4.83	0.0115	0.11
	Ojiya	26	10.7013	8.6557	79.91	0.6957	6.50	0.1847	1.73	0.0324	0.30	0.1517	1.42	0.5103	4.76	0.0088	0.08
		27	11.5684	8.4559	73.09	0.7413	6.41	0.2020	1.74	0.0317	0.27	0.1563	1.35	0.5103	4.41	0.0133	0.11
		Moy-Aver	11.1349	8.5558	76.50	0.7185	6.45	0.1934	1.74	0.0321	0.29	0.1540	1.39	0.5103	4.59	0.0110	0.09
	Riz cuit Boiled rice	28	10.6592	8.9238	83.72	0.6387	5.89	0.1989	1.86	0.0330	0.31	0.1681	1.58	0.5147	4.82	0.0089	0.09
		29	10.3565	8.1636	78.82	0.7299	7.05	0.1686	1.62	0.0275	0.26	0.1729	1.67	0.5474	5.28	0.0101	0.09
		Moy-Aver	10.5079	8.5437	81.27	0.6843	6.47	0.1837	1.74	0.0302	0.29	0.1705	1.63	0.5310	5.05	0.0095	0.09
Shimizu	Riz cuit Boiled rice	24	11.3481	8.8690	78.15	0.8310	7.32	0.1989	1.75	0.0296	0.26	0.1479	1.30	0.5149	4.53	0.0135	0.12
		25	11.6786	9.6634	82.74	0.6272	5.37	0.2171	1.86	0.0310	0.27	0.1981	1.69	0.5326	4.56	0.0101	0.09
		Moy-Aver	11.5134	9.2662	80.44	0.7291	6.34	0.2080	1.81	0.0303	0.27	0.1730	1.49	0.5238	4.55	0.0118	0.10
	Ojiya	26	12.3397	9.1146	73.86	0.6729	5.45	0.2171	1.76	0.0329	0.25	0.1686	1.36	0.6326	4.31	0.0149	0.12
		27	13.0007	10.2460	78.81	0.8211	6.31	0.2080	1.59	0.0365	0.28	0.1742	1.34	0.5236	4.02	0.0140	0.11
		Moy-Aver	12.6702	9.6803	76.34	0.7470	5.88	0.2125	1.77	0.0347	0.27	0.1714	1.35	0.5281	4.17	0.0144	0.12

(Continuation.)

Sujets Subjects	Période Period	Date	Azote total Total N.	Azote de l'urée Urea N.		Azote de NH^3 Ammonia N.		Azote de l'acide urique Uric acid N.		Azote des bases puriques Purin base N.		Azote des acides aminés Amino acid N.		Azote de la créatinine Creatinin N.		Azote de la créatine Creatin N.	
		Mai-May	(g)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
Schimizu	Riz cuit Boiled rice	28	12.2285	9.6143	78.62	0.5930	4.85	0.2201	1.79	0.0358	0.29	0.1793	1.46	0.5236	4.28	0.0140	0.11
		29	13.2211	10.5127	79.51	0.7755	5.86	0.2141	1.62	0.0351	0.27	0.1935	1.46	0.5376	4.06	0.0098	0.07
		Moy-Aver	12.7248	10.0914	79.07	0.6842	5.35	0.2171	1.71	0.0355	0.28	0.1864	1.46	0.5306	4.17	0.0119	0.10
Tanaka	Riz cuit Boiled rice	24	9.3649	7.7529	82.78	0.7869	8.40	0.1868	1.99	0.0168	0.28	0.2232	2.38	0.4934	5.27	0.0084	0.09
		25	9.4751	7.6079	80.29	0.5816	6.14	0.2020	2.13	0.0303	0.32	0.2219	2.34	0.4934	5.21	0.0084	0.09
		Moy-Aver	9.4200	7.7304	81.54	0.6842	7.27	0.1944	2.06	0.0286	0.30	0.2226	2.36	0.4934	5.24	0.0084	0.09
	Ojiya	26	9.9158	7.4922	75.56	0.6159	6.26	0.1989	2.01	0.0324	0.33	0.2248	2.26	0.4704	4.74	0.0074	0.07
		27	11.1177	9.1065	81.91	0.7299	6.56	0.2080	1.87	0.0330	0.29	0.1967	1.77	0.4856	4.36	0.0120	0.18
		Moy-Aver	10.5168	8.2994	78.74	0.6729	6.39	0.2034	1.94	0.0327	0.31	0.2107	2.02	0.4780	4.55	0.0097	0.13
	Riz cuit Boiled rice	28	10.7013	8.7911	82.15	0.6615	6.18	0.1929	1.80	0.0317	0.29	0.1905	1.78	0.4817	4.50	0.0117	0.11
		29	9.9158	7.7204	77.85	0.8212	8.28	0.1686	1.70	0.0275	0.28	0.2219	2.24	0.5018	5.06	0.0085	0.08
		Moy-Aver	10.3086	8.2558	80.00	0.7914	7.23	0.1857	1.75	0.0296	0.29	0.2062	2.01	0.4917	4.78	0.0101	0.10
Kato	Riz cuit Boiled rice	24	12.2846	9.8048	79.81	0.8326	6.77	0.1847	1.50	0.0310	0.25	0.1991	1.62	0.5427	4.41	0.0149	0.12
		25	11.5600	9.2493	80.16	0.6729	5.82	0.2323	2.01	0.0296	0.25	0.2048	1.77	0.5846	5.05	0.0175	0.15
		Moy-Aver	11.9223	9.5088	79.98	0.7527	6.29	0.2085	1.75	0.0303	0.25	0.2019	1.69	0.5637	4.73	0.0162	0.14
	Ojiya	26	11.5684	8.7580	75.71	0.6272	5.42	0.2232	1.93	0.0317	0.27	0.1742	1.51	0.5575	4.82	0.0159	0.13
		27	12.0091	8.8033	73.35	0.7853	6.54	0.1868	1.55	0.0333	0.27	0.1563	1.30	0.5792	4.82	0.0113	0.09
		Moy-Aver	11.7888	8.7807	74.53	0.7062	5.98	0.2050	1.74	0.0325	0.27	0.1652	1.41	0.5684	4.82	0.0136	0.11
	Riz cuit Boiled rice	28	12.1744	9.4973	78.01	0.6729	5.52	0.2020	1.66	0.0351	0.29	0.2017	1.65	0.5903	4.85	0.0178	0.14
		29	11.0176	8.5718	77.91	0.6387	5.50	0.1686	1.45	0.0227	0.19	0.2064	1.78	0.5680	4.89	0.0109	0.09
		Moy-Aver	11.5960	9.0346	77.96	0.6558	5.51	0.1853	1.56	0.0289	0.24	0.2041	1.67	0.5796	4.87	0.0143	0.12

Daily Output of SO_3, P_2O_5, and NaCl in the Urine.

Date	Kayano			Imai		
	SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	NaCl(g)
Mai-May						
24	1.7282	1.0440	20.0	1.7872	1.4964	21.5
25	1.6198	1.5312	19.9	1.6810	1.5138	16.6
Moyenne –Aver.	1.6740	1.2876	20.0	1.7341	1.5051	19.1
26	1.9826	1.6109	22.9	1.8379	1.2528	20.8
27	1.8043	1.3746	19.9	1.9374	1.4610	16.4
Moyenne –Aver.	1.8935	1.4927	21.4	1.8876	1.3569	18.6
28	1.7234	1.7748	15.7	1.7726	1.7052	21.2
29	1.7213	1.5886	22.1	1.6535	1.5312	19.9
Moyenne –Aver.	1.7224	1.6817	18.9	1.7130	1.6682	20.6

Date	Shimizu			Tanaka			Kato		
	SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	NaCl(g)
Mai-May									
24	1.8018	1.6872	26.0	1.7111	1.5138	22.8	2.0364	1.4442	17.6
25	2.0718	1.6872	21.0	1.6805	1.6704	13.6	1.8737	1.6008	19.6
Moyenne –Aver.	1.9368	1.6872	23.5	1.6958	1.5921	18.2	1.9551	1.5725	18.6
26	2.1582	1.7748	23.1	1.6891	1.2528	17.6	2.1104	1.6182	19.9
27	2.1325	1.7922	19.4	1.8935	1.6356	19.4	2.1744	1.4762	20.8
Moyenne –Aver.	2.1453	1.7835	21.3	1.7413	1.4442	18.5	2.1424	1.5472	20.4
28	2.1356	2.2446	19.5	1.7255	1.9488	19.7	2.1054	1.7052	21.8
29	2.1232	2.1750	18.2	1.6617	1.7748	20.8	1.7789	1.5660	16.4
Moyenne –Aver.	2.1244	2.2098	18.9	1.6936	1.8628	20.3	1.9421	1.6356	14.1

Sujets Subject	Période Period	Absorption d'azote Moyenne journalière N. intake Average per day		Azote trouvé dans l'urine Moyenne journalière N. in urine Average per day		Azote trouvé dans les selles Moyenne journalière N. in fæces Average per day		Gains ou pertes en azote Nitrogen balance	Absorption Moyenne journalière Absorption Average per day			Pourcentage d'absorption % of absorption
		Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake		Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Calories	
Kayano . .	Riz cuit . . . . Boiled rice . . .	14.0388	87.7425	10.1086	72.00	1.8723	13.33	+ 2.0579	12.1665	76.0406	311.766	86.67
	Ojiya . . . . . Riz cuit	11.6362	72.7263	10.4187	89. 53	1.6091	13.83	— 0.3916	10.0271	62.6694	256.945	86.17
	Boiled rice . . .	14.0388	87.7425	10.1361	72.20	1.8032	12.85	+ 2.0995	12.2356	76.4727	313.538	87.15
Imai . . .	*Idem*	15.9316	99.5725	10.8799	68.29	2.0925	13.14	+ 2.9592	13.8391	86.4944	354.627	86.86
		12.0458	75.2863	11.1349	92.43	1.8756	15.57	— 0.9547	10.1702	63.5638	260.612	84.43
		15.6950	98.0938	10.5079	66.95	2.2316	14.22	+ 2.9555	13.4634	84.1463	345.000	85.78
Shimizu . .	*Idem*	15.6950	98.0938	11.5134	73.35	2.4519	15.62	+ 1.7297	13.2431	82.7694	339.355	84.38
		11.4314	71.4463	12.6702	110.83	1.9118	16.72	— 3.1506	9.5196	59.4975	243.940	83.28
		15.9316	99.5725	12.7248	79.87	1.9377	12.16	+ 1.2691	13.9939	87.4619	358.594	87.84
Tanaka . .	*Idem*	14.0388	87.7425	9.4200	67.10	2.1840	14.84	+ 2.4338	11.8538	74.0863	303.754	85.16
		11.6362	72.7263	10.5168	90.39	2.0218	17.37	— 0.9024	9.6144	60.0900	246.369	82.63
		14.7486	92.1788	10.3086	69.89	2.1228	14.39	+ 2.3172	12.6258	78.9113	323.536	85.61
Kato . . .	*Idem*	15.2228	95.1425	11.9223	78.32	2.2276	14.63	+ 1.7029	12.9952	81.2200	333.002	85.37
		11.5338	72.0863	11.7888	102.21	2.0931	18.06	— 2.3481	9.4407	59.0044	241.918	81.94
		15.4584	96.6150	11.5960	75.01	2.1225	13.73	+ 1.7399	13.3359	83.3494	341.733	86.27

Digestibility and Utilisation of the Carbohydrate (as Glucose) and its Caloric Value.

Sujets Subject	Période Period	Absorption des hydrates de carbone Moy. jour. (gr.) Carbohydrate intake Average per day (gms.)	Hydrates de carb. élim. dans les selles Moyenne journal. Carbohydrate in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
	Riz cuit . . .	489.11	1.0851	0.22	488.02	2000.882	99.78
	Boiled rice . .						
Kayano .	Ojiya	239.27	0.7440	0.31	238.53	977.973	99.69
	Riz cuit . . .	489.11	1.1867	0.24	487.92	2000.472	99.76
	Boiled rice . .						
		633.83	1.5509	0.24	632.28	2592.348	99.76
nai . .	*Idem*	262.31	1.4008	0.53	260.91	1069.731	99.47
		615.74	2.2053	0.35	613.53	2515.473	99.65
		615.74	1.5964	0.25	614.14	2517.974	99.75
nimizu .	*Idem*	227.75	1.3607	0.60	226.39	928.199	99.40
		633.83	1.8292	0.28	632.00	2591.200	99.72
		489.11	1.8314	0.38	487.28	1997.818	99.62
anaka .	*Idem*	239.27	1.1210	0.47	238.15	976.415	99.53
		543.38	1.5042	0.27	541.88	2221.708	99.73
		579.56	1.4760	0.25	578.08	2370.128	99.75
ato . .	*Idem*	233.51	1.4485	0.61	232.06	951.446	99.39
		597.65	1.6461	0.25	596.00	2443.600	99.75

Digestibility and Utilisation of Crude Fat and its Caloric Value.

Sujets Subject	Période Period	Absorption de la graisse Moy. jour. (gr.) Fat intake Average per day (gms.)	Graisse éliminée dans les selles Moyenne journal. Fat in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
Kayano .	Riz cuit . . . Boiled rice . .	20.22	1.7427	8.61	18.48	171.864	91.39
	Ojiya	19.42	0.9906	5.10	18.43	171.399	94.90
	Riz cuit . . . Boiled rice . .	20.22	1.8190	9.00	18.40	171.120	91.00
Imai . .	*Idem*	21.50	1.7736	8.24	19.73	183.489	91.76
		19.80	1.4211	7.17	18.38	170.934	92.83
		21.34	2.1220	9.94	19.22	178.746	90.06
Shimizu .	*Idem*	21.34	2.0558	9.63	19.28	179.304	90.37
		19.23	1.5849	8.24	17.65	164.145	91.76
		21.50	1.7531	8.15	19.75	183.675	91.85
Tanaka	*Idem*	20.22	2.2533	11.14	17.97	167.121	88.86
		19.42	1.6207	8.34	17.80	165.540	91.66
		20.70	2.2612	10.92	18.44	171.492	89.08
Kato . .	*Idem*	21.02	2.0746	9.86	18.95	176.235	90.14
		19.33	1.7462	9.03	17.58	163.494	90.97
		21.18	2.1059	9.92	19.07	177.351	90.08

Digestibility and Utilisation of Crude Ash.

Sujets Subject	Période Period	Absorption des cendres Moy. journ. (gr.) Ash intake Average per day (gms.)	Cendres éliminées dans les selles Moyenne journalière Ash in fæces Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	
	Riz cuit.	24.71	2.7690	11.20	88.80
	Boiled rice				
ayano .	Ojiya	26.31	1.5840	6.02	93.98
	Riz cuit.	24.71	2.7144	10.94	89.06
	Boiled rice				
		25.35	3.2832	12.94	87.06
nai . .	*Idem*	26.75	3.4366	12.89	87.10
		25.27	3.9650	15.69	84.31
		25.27	2.8869	11.42	88.58
iimizu. .	*Idem*	26.09	2.4719	9.47	90.53
		25.35	2.4247	9.57	90.43
		24.71	3.0643	12.43	87.57
anaka .	*Idem*	26.31	3.1161	11.84	88.16
		24.95	3.4397	13.79	86.21
		25.11	2.8178	11.22	88.78
ato . . .	*Idem*	26.20	3.1014	11.83	88.17
		25.19	3.0379	12.09	87.91

Percentage of the Caloric Value of Food actually utilised by the Body.

Sujets Subject	Période Period	Absorption des calories Moyenne journalière Calories intake Average per day		Utilisation des calories Calories utilisation		% de la quantité de calories absorbée % against calories intake
		Calories totales Total calories	Par kg. du poids Per kg. of body weight	Calories totales Total calories	Par kg. du poids Per kg. of body weight	
Kayano .	Riz cuit . . . . Boiled rice . . .	2553.141	52.32	2484.512	50.91	97.31
	Ojiya	1459.791	30.22	1406.317	29.11	96.33
	Riz cuit . . . . Boiled rice . . .	2553.141	52.37	2485.130	50.98	97.34
Imai . . .	*Idem*	3206.900	63.53	3130.464	62.01	97.61
		1568.285	31.13	1501.277	30.00	96.37
		3125.180	62.38	3039.219	60.66	97.24
Shimizu .	*Idem*	3125.180	58.36	3036.633	56.71	97.17
		1405.544	26.44	1336,284	25.15	95.12
		3206.900	60.18	3133.469	58.81	97.72
Tanaka .	*Idem*	2553.141	54.73	2468.723	52.92	96.69
		1459.791	31.39	1388.324	29.86	95.13
		2798.301	60.01	2716.736	58.36	97.25
Kato . .	*Idem*	2961.766	55.38	2879.365	53.84	97.22
		1432.714	26.83	1356.858	25.41	94.71
		3043.470	56.78	2962.684	55.27	97.34

Digestibility and Utilisation of Each Constituent.

Période Period	Azote total Total nitrogen %	Hydrates de carbone comme le glycose Carbo-hydrate as glucose %	Graisse brute Crude fat %	Cendres brutes Crude ash %	Calories %
Riz cuit — Boiled rice	85.688	99.732	90.504	88.158	97.200
Ojiya	83.690	99.496	92.424	89.548	95.532
Riz cuit — Boiled rice	86.530	99.722	90.414	87.584	97.378

clusion.

1. The digestibility and utilisation of total nitrogen and carbohydrates were ter when ordinary boiled rice was used than when " Ojiya " was used, but in case of crude ash and crude fat they were worse. The amount of energy supplied greater during the boiled-rice period.

2. More " Ojiya " was eaten than boiled rice; but if we compared the amounts erms of uncooked rice, we found the real quantity of " Ojiya " was much smaller ı that of boiled rice. The required amount of energy could not be supplied by jiya ".

3. The daily amounts of urine increased during the " Ojiya " period.

4. The ratio of urea nitrogen to total nitrogen in the urine was slightly less ng the " Ojiya " period.

5. There was no great difference in the output of fæces during the two periods.

Experiment V.

Comparison of the Digestibility and Utilisation of " Sushi " and Ordinary Boiled Rice.

For the preparation of " Sushi " rice was cooked in the usual way and 180 cc. inegar, 50 gms. of sugar and 5 gms. of NaCl were then added: the mixture then cooled. We obtained an average of 2,510 gms. of " Sushi ".

Daily Output of the Total Nitrogen and the Distribution of Nitrogenous Constituents in the Urine.

Sujets Subjects	Période Period	Date	Azote total Total N.	Azote de l'urée Urea N.		Azote de NH^3 Ammonia N.		Azote de l'acide urique Uric acid N.		Azote des bases puriques Purin base N.		Azote des acides aminés Amino acid N.		Azote de la créatinine Creatinin N.		Azote de la créatine Creatin N.	
		Juin-June	(g)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
Nakamura	Riz cuit Boiled rice	21	11.8439	10.2740	86.74	0.6045	5.10	0.2170	1.83	0.0264	0.22	0.1794	1.51	0.6022	5.08	0.0669	0.56
		22	12.8121	10.6218	82.99	0.5816	4.53	0.2340	1.90	0.0174	0.13	0.1728	1.34	0.5790	4.51	0.0901	0.70
		Moy-Aver	12.3280	10.4479	84.86	0.5930	4.82	0.2255	1.87	0.0219	0.17	0.1761	1.43	0.5906	4.80	0.0785	0.63
	Sushi	23	12.3317	9.9007	80.28	0.6273	5.08	0.2020	1.63	0.0208	0.16	0.1661	1.34	0.5846	4.74	0.0696	0.56
		24	11.4835	8.7553	76.24	0.7755	6.73	0.2092	1.82	0.0188	0.16	0.1702	1.48	0.5846	5.09	0.0427	0.37
		Moy-Aver	11.9076	9.3280	78.26	0.7014	5.91	0.2056	1.73	0.0198	0.16	0.1682	1.41	0.5846	4.92	0.0562	0.47
	Riz cuit Boiled rice	25	12.5548	10.3337	82.31	0.7299	5.81	0.2266	1.80	0.0230	0.18	0.1629	1.29	0.6022	4.79	0.0596	0.47
		26	11.0389	8.6667	78.51	0.6957	6.30	0.1929	1.74	0.0244	0.22	0.1558	1.41	0.6022	5.45	0.0384	0.34
		Moy-Aver	11.7969	9.5502	80.41	0.7128	6.06	0.2098	1.76	0.0237	0.20	0.1594	1.35	0.6022	5.12	0.0490	0.41
Tanaka	Riz cuit Boiled rice	21	9.9709	7.9198	79.43	0.6616	6.63	0.2200	2.21	0.0307	0.31	0.2129	2.13	0.5790	5.81	0.0355	0.35
		22	10.9389	8.7465	80.00	0.8440	7.72	0.2444	2.23	0.0251	0.23	0.2119	1.94	0.5790	5.29	0.0232	0.21
		Moy-Aver	10.4549	8.8332	79.72	0.7528	7.18	0.2322	2.22	0.0279	0.27	0.2124	2.04	0.5790	5.55	0.0294	0.33
	Sushi	23	10.7037	8.0017	74.76	0.7641	7.14	0.2171	2.03	0.0209	0.19	0.2048	1.91	0.5960	5.57	0.0246	0.23
		24	10.7601	7.9987	74.34	0.7755	7.27	0.2189	2.03	0.0251	0.23	0.1867	1.73	0.6022	5.59	0.0186	0.17
		Moy-Aver	10.7319	8.0002	74.55	0.7698	7.21	0.2180	2.03	0.0230	0.21	0.1958	1.82	0.5991	5.58	0.0216	0.20
	Riz cuit Boiled rice	25	10.5812	8.1733	77.24	0.7755	7.33	0.2141	2.02	0.0272	0.25	0.1474	1.39	0.5790	5.47	0.0232	0.22
		26	9.5331	7.4048	77.67	0.7071	7.41	0.1929	2.02	0.0230	0.24	0.1836	1.92	0.5790	6.07	0.0232	0.22
		Moy-Aver	10.0572	7.7891	77.46	0.7413	7.37	0.2035	2.02	0.0251	0.25	0.1655	1.66	0.5790	5.77	0.0232	0.22
Imai	Riz cuit Boiled rice	21	11.5684	8.9463	77.34	0.7071	6.11	0.2140	1.85	0.0181	0.16	0.1736	1.50	0.4933	4.26	0.0126	0.11
		22	12.1544	9.7918	80.56	0.7755	6.38	0.2262	1.86	0.0307	0.25	0.1774	1.46	0.4779	3.90	0.0117	0.09
		Moy-Aver	11.8614	9.3691	78.95	0.7413	6.25	0.2201	1.86	0.0244	0.21	0.1755	1.48	0.4856	4.08	0.0122	0.10
		23	11.9347	10.9144	74.61	0.8326	6.97	0.1838	1.54	0.0201	0.17	0.1771	1.48	0.5102	4.27	0.0133	0.11
														0.5190	4.05	0.0091	0.07

Sujets Subject	Période Period	Date	Azote total Total N.	Urea N.		Ammoniaque NH^3 Ammonia N.		Azote urique Uric acid N.		Azote des bases puriques Purin base N.		Azote des acides aminés Amino acid N.		Azote de la créatinine Creatinin N.		Azote de la créatine Creatin N.	
		Juin-June	(g)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
Imai	Riz cuit Boiled rice	25	11.6966	10.0996	86.34	0.5930	5.07	0.2050	1.75	0.0230	0.19	0.1693	1.44	0.4652	3.97	0.0185	0.15
		26	11.6966	9.4837	81.08	0.7527	6.43	0.1958	1.67	0.0250	0.21	0.1780	1.52	0.4740	4.05	0.0154	0.13
		Moy-Aver	11.6966	9.7917	83.71	0.6729	5.75	0.2004	1.71	0.0240	0.20	0.1737	1.48	0.4696	4.01	0.0170	0.14
Shimizu	Riz cuit Boiled rice	21	10.1912	8.3527	81.96	0.4787	4.70	0.1929	1.90	0.0272	0.22	0.1849	1.81	0.4816	4.72	0.0117	0.12
		22	11.9412	8.8809	74.37	0.6957	5.82	0.2223	1.86	0.0306	0.25	0.1832	1.53	0.5376	4.50	0.0098	0.08
		Moy-Aver	11.0662	8.6168	78.16	0.5872	5.26	0.2076	1.88	0.0289	0.23	0.1841	1.67	0.5096	4.61	0.0108	0.10
	Sushi	23	13.6029	11.0202	81.01	1.0036	7.37	0.2262	1.66	0.0286	0.21	0.1605	1.18	0.5474	4.02	0.0101	0.07
		24	11.8639	9.0443	76.23	0.6957	5.85	0.1994	1.90	0.0306	0.25	0.1493	1.26	0.5376	4.85	0.0098	0.08
		Moy-Aver	12.7334	10.0323	78.62	0.8497	6.61	0.2133	1.78	0.0296	0.23	0.1549	1.22	0.5425	4.94	0.0100	0.08
	Riz cuit Boiled rice	25	12.3698	9.9363	80.41	1.1252	9.09	0.2171	1.76	0.0328	0.26	0.1474	1.19	0.5376	4.34	0.0098	0.08
		26	11.6105	8.8856	76.53	0.8554	7.37	0.1959	1.69	0.0230	0.20	0.1725	1.48	0.4894	4.22	0.0123	0.11
		Moy-Aver	11.9902	9.4160	78.74	0.9903	8.73	0.2065	1.68	0.0279	0.23	0.1600	1.33	0.5135	4.28	0.0110	0.10
Tanaka	Riz cuit Boiled rice	21	9.3649	7.4656	80.78	0.6729	7.18	0.1807	1.92	0.0279	0.28	0.1569	1.66	0.4895	5.22	0.0123	0.13
		22	11.5393	8.5100	73.83	0.9124	7.90	0.2505	2.17	0.0237	0.20	0.1554	1.34	0.4895	4.24	0.0123	0.10
		Moy-Aver	10.4521	7.9878	77.30	0.7927	7.54	0.2156	2.05	0.0258	0.24	0.1562	1.50	0.4895	4.73	0.0123	0.12
	Sushi	23	11.9755	9.0098	75.23	1.1405	9.52	0.1625	1.35	0.0237	0.19	0.1778	1.48	0.4741	3.12	0.0076	0.06
		24	12.1428	8.2169	67.67	1.2659	10.42	0.2067	1.70	0.0313	0.25	0.1537	1.26	0.4933	4.06	0.0126	0.11
		Moy-Aver	12.0592	8.6134	71.45	1.2032	9.97	0.1846	1.53	0.0275	0.22	0.1658	1.37	0.4837	3.59	0.0101	0.09
	Riz cuit Boiled rice	25	10.9274	8.1750	74.79	1.2063	11.04	0.2110	1.92	0.0215	0.19	0.1638	1.49	0.4704	4.28	0.0113	0.10
		26	11.7106	8.6525	73.90	1.0721	9.16	0.1928	1.64	0.0223	0.13	0.1669	1.43	0.4778	4.08	0.0117	0.10
		Moy-Aver	11.3190	8.4138	74.34	1.1392	10.10	0.2019	1.83	0.0219	0.16	0.1654	1.46	0.4741	4.18	0.0115	0.10

Daily Output of SO_3, P_2O_5, and NaCl in the Urine.

Période Period	Date	Nakamura			Tanaka		
		SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	N
Riz cuit Boiled rice	Juin-June 21	2.0793	1.3670	17.9	1.8098	1.1025	
	22	1.9420	1.5141	19.2	1.7858	1.2789	
	Moyenne — Aver.	2.0107	1.4406	18.6	1.7978	1.1907	
Sushi	23	2.0039	1.4112	23.6	1.8277	1.2936	
	24	1.9058	1.1319	21.4	1.8939	1.2495	
	Moyenne — Aver.	1.9549	1.2716	22.5	1.8608	1.2716	
Riz cuit Boiled rice	25	1.9278	1.3083	20.7	1.6878	1.3377	
	26	1.8729	1.2642	20.8	1.7982	1.1025	
	Moyenne — Aver.	1.9004	1.2863	20.8	1.7430	1.2201	

Période Period	Date	Imai			Shimizu			Tanaka	
		SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)
Riz cuit Boiled rice	Juin-June 21	1.9045	1.3818	20.1	1.8958	1.2936	24.0	1.8064	1.5147
	22	1.8215	1.3230	18.9	1.9101	1.4406	17.3	1.8571	1.5876
	Moyenne — Aver.	1.8630	1.3524	19.5	1.9030	1.3671	20.7	1.8318	1.5512
Sushi	23	1.9058	1.2642	20.6	2.1951	1.7787	28.0	1.8736	1.3083
	24	1.9408	1.3083	22.7	2.1308	1.6023	18.8	2.1719	1.3377
	Moyenne — Aver.	1.9233	1.2863	21.7	2.1630	1.6905	23.4	2.0228	1.3230
Riz cuit Boiled rice	25	1.8853	1.4553	17.5	2.2138	1.5288	23.6	1.7824	1.5876
	26	1.8352	1.4112	16.8	1.9881	1.6758	21.4	1.9769	1.4406
	Moyenne — Aver.	1.8603	1.4333	17.2	2.1010	1.6023	22.5	1.8797	1.5141

Sujets Subject	Période Period	Absorption d'azote Moyenne journalière N. intake Average per day		Azote trouvé dans l'urine Moyenne journalière N. in urine Average per day		Azote trouvé dans les selles Moyenne journalière N. in fæces Average per day		Gains ou pertes en azote Nitrogen balance	Absorption Moyenne journalière Absorption Average per day			Pourcentage d'absorption % of absorption
		Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake		Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Calories	
Nakamura .	Riz cuit . . . . Boiled rice . . .	13.7823	86.1394	12.3280	89.74	2.4226	17.57	— 0.9683	11.3597	70.9981	291.092	82.43
	Sushi	14.0452	87.7825	11.9076	84.78	2.1654	15.42	— 0.0278	11.8798	74.2488	304.420	84.58
	Riz cuit . . . . Boiled rice . . .	13.7823	86.1394	11.7969	85.89	2.2766	16.52	— 0.2912	11.5057	71.9106	294.833	83.48
Tanaka . .	*Idem*	14.0283	87.6800	10.4549	74.52	2.8520	20.33	+ 0.7219	11.1768	69.7950	286.160	79 67
		14.0452	87.7825	10.7319	76.41	2.3851	16.98	+ 0.9282	11.6601	72.8756	298.790	83.02
		14.2752	89.2200	10.0572	70.45	2.8491	19.95	+ 1.3689	11.4261	71.4131	292.794	80.05
Imai . . .	*Idem*	15.2610	95.3813	11.8614	77.72	2.6278	17.21	+ 0.7718	12.6332	78.9575	323.726	82.79
		15.5956	97.4725	12.3734	79.34	2.2588	14.48	+ 0.9634	13.3368	83.3550	341.756	85.52
		15.2610	95.3813	11.6966	76.64	2.5336	16.60	+ 1.0308	12.7274	79.5462	326.139	83.40
Shimizu . .	*Idem*	15.2610	95.3813	11.0662	72.51	2.5840	16.93	+ 1.6108	12.6770	79.2312	324.848	83.07
		16.1124	100.7025	12.7334	79.03	2.3116	14.34	+ 1.0674	13.8008	86.2550	353.646	85.66
		15.5075	96.9219	11.9902	77.32	2.5660	16.55	+ 0.9513	12.9415	80.8844	331.626	83.45
T. Tanaka .	*Idem*	14.2752	89.2200	10.4521	73.22	2.8334	19.84	+ 0.9897	11.4418	71.6113	293.606	80.16
		14.7704	92.3150	10.0592	68.10	2.5951	17.57	+ 2.1161	12.1753	76.0956	311.992	82.43
		14.2752	89.2200	11.3190	79.29	2.6654	18.68	+ 0.2908	11.6098	72.5613	297.501	81.32

Digestibility and Utilisation of the Carbohydrate (as Glucose) and its Caloric Val

Sujets Subject	Période Period	Absorption des hydrates de carbone Moy. jour. (gr.) Carbohydrate intake Average per day (gms.)	Hydrates de carb. élim. dans les selles Moyenne journal. Carbohydrate in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		P cen d' sor
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	of sor
Nakamura	Riz cuit . . . Boiled rice . .	503.53	1.2640	0.25	502.27	2059.307	9
	Sushi	520.47	1.0704	0.20	519.40	2129.540	9
	Riz cuit . . . Boiled rice . .	503.53	1.3052	0.26	502.22	2059.102	9
Tanaka .	*Idem*	523.92	1.3003	0.25	522.62	2142.742	9
		520.47	1.2595	0.24	519.21	2128.761	9
		544.31	1.8264	0.33	542.48	2224.168	9
Imai . .	*Idem*	625.87	1.5357	0.24	624.33	2559.753	9
		647.43	1.4149	0.22	646.02	2648.682	9
		625.87	1.8994	0.30	623.97	2558.277	9
Shimizu .	*Idem*	625.87	1.3948	0.22	624.48	2560.368	9
		689.75	1.6326	0.23	688.12	2821.292	9
		646.26	1.5583	0.24	644.70	2643.270	9
T.Tanaka	*Idem*	544.31	1.2049	0.23	543.11	2226.751	9
		583.95	1.1856	0.20	582.76	2389.316	9
		544.31	1.4325	0.26	542.90	2225.890	9

Digestibility and Utilisation of Crude Fat and its Caloric Value.

Sujets ubject	Période Period	Absorption de la graisse Moy. jour. (gr.) Fat intake Average per day (gms.)	Graisse éliminée dans les selles Moyenne journal. Fat in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
	Riz cuit . . .	20.67	2.3409	11.32	18.33	170.469	88.68
	Boiled rice . .						
kamura	Sushi	18.91	1.3422	7.09	17.57	163.401	92.91
	Riz cuit . . .	20.67	1.6420	7.94	19.03	176.979	92.06
	Boiled rice . .						
		20.87	2.1407	10.25	18.73	174.189	89.75
aka	*Idem*	18.91	1.4048	7.43	17.51	162.843	92.57
		21.06	2.0185	9.58	19.04	177.072	90.42
		21.84	1.7689	8.10	20.07	186.651	91.90
i . .	*Idem*	19.60	1.4280	7.28	18.17	168.981	92.72
		21.84	1.9105	8.78	19.93	185.349	91.26
		21.84	1.8735	8.58	19.97	185.721	91.42
nizu .	*Idem*	19.83	1.5606	7.86	18.27	169.911	92.14
		22.04	2.0499	9.76	19.99	185.907	90.24
		21.06	2.3361	11.09	18.72	174.096	88.91
naka	*Idem*	19.26	1.9378	10.05	17.32	161.076	89.95
		21.06	2.2877	10.86	18.77	174.561	89.14

Digestibility and Utilisation of Crude Ash.

Sujets Subject	Période Period	Absorption des cendres Moy. journ. (gr.) Ash intake Average per day (gms.)	Cendres éliminées dans les selles Moyenne journalière Ash in fæces Average per day		Pourcen d'al sorpt
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	% absorp
Nakamura	Riz cuit.	24.88	3.6130	14.52	85.
	Boiled rice				
	Sushi	25.76	2.8045	10.88	89.
	Riz cuit.	24.88	3.1906	12.82	87.
	Boiled rice				
Tanaka .	*Idem*	24.98	2.9560	11.83	88.
		25.76	2.7328	10.61	89.
		25.07	3.6425	14.53	85.
Imai . .	*Idem*	25.45	2.8152	11.06	88.
		26.57	2.6923	10.13	89.
		25.45	3.4061	13.38	86.
Shimizu. .	*Idem*	25.45	2.7086	11.04	88.
		26.84	3.1681	11.80	88.
		25.55	3.5641	13.91	86.
T. Tanaka.	*Idem*	25.07	3.2411	12.92	87.
		26.57	3.1927	12.01	87.
		25.07	3.2461	12.95	87.

Percentage of the Caloric Value of Food actually utilised by the Body.

Sujets Subject	Période Period	Absorption des calories Moyenne journalière Calories intake Average per day		Utilisation des calories Caloric utilisation		% de la quantité de calories absorbée % against calories intake
		Calories totales Total calories	Par kg. du poids Per kg. of body weight	Calories totales Total calories	Par kg. du poids Per kg. of body weight	
kamura	Riz cuit	2609.875	46.86	2520.868	45.26	96.59
	Boiled rice . . .					
	Sushi	2669.698	47.93	2597.361	46.63	97.29
	Riz cuit	2609.875	46.94	2530.914	45.52	96.97
	Boiled rice . . .					
naka. .	*Idem*	2711.651	51.80	2603.091	49.72	95.98
		2669.698	50.96	2590.394	49.45	97.03
		2793.329	53.31	2694.034	51.41	96.43
ni. . .	*Idem*	3160.242	62.70	3070.130	60.91	97.14
		3236.380	63.92	3159.419	62.40	97.62
		3160.242	62.33	3069.765	60.55	97.30
nizu .	*Idem*	3160.242	58.47	3070.937	56.82	97.18
		3425.374	63.30	3344.849	61.83	97.68
		3252.018	60.11	3160.803	58.42	97.19
anaka	*Idem*	2793.329	60.03	2694.453	57.01	96.47
		2951.804	63.37	2862.384	61.45	96.97
		2793.329	60.00	2697.952	57.90	96.50

Digestibility and Utilisation of Each Constituent.

Période Period	Azote total Total nitrogen %	Hydrates de carbone comme le glycose Carbo-hydrate as glucose %	Graisse brute Crude fat %	Cendres brutes Crude ash %	Calor %
Riz cuit — Boiled rice	81.624	99.764	90.132	87.726	96.6
Sushi	84.242	99.782	92.058	88.914	97.3
Riz cuit — Boiled rice	82.340	99.722	90.624	86.482	96.8

Conclusion.

1. The digestibility and utilisation of each constituent were better whe used polished rice as " Sushi " than when we used it as boiled rice. The an of energy supplied was rather more during the " Sushi " period.

2. The quantity of " Sushi " eaten was almost equal to that of ordinary b rice. The appetite was the same during the two periods.

3. The ratio of total nitrogen in the urine to nitrogen intake was greater d the " Sushi " period, but the individual nitrogenous compounds in the urine v but little except in the case of the urea nitrogen, the ratio of which to the urine nitrogen was slightly smaller during the " Sushi " period.

4. The output of fæces was less during the " Sushi " period than durin boiled rice period.

Experiment VI (*a*).

Comparison of the Digestibility and Utilisation of " Akanogohan " and Or Boiled Rice.

For the preparation of " Akanogohan " 1,171 gms. of washed polishe were cooked with 1,600 cc. of water and 400 cc. of juice prepared from boil beans; we obtained in this way 3,023 gms. of " Akanogohan ".

For the preparation of the juice of boiled red beans 1,470 gms. of red were washed and boiled in 10,000 cc. of water for one hour. The juice was sq through a cotton cloth. The beans were again boiled for an hour and a-ha the juice extracted as before. We obtained altogether 3,300 cc. of juice.

Sujets Subjects	Période Period	Date	Azote total Total N.	Azote de l'urée Urea N.		Azote de NH^3 Ammonia N.		Azote de l'acide urique Uric acid N.		Azote des bases puriques Purin base N.		Azote des acides aminés Amino acid N.		Azote de la créatinine Creatinin N.		Azote de la créatine Creatin N.	
		Nov.	(g)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
Higuchi	Riz cuit Boiled rice	2	10.0980	8.7996	87.14	0.4787	4.74	0.1807	1.79	0.0223	0.22	0.1712	1.69	0.5018	4.96	0.0129	0.12
		3	12.9336	10.4032	80.43	0.5360	4.14	0.2354	1.82	0.0250	0.18	0.1666	1.29	0.6022	4.65	0.0123	0.09
		Moy-Aver	11.5158	9.6014	83.78	0.5073	4.44	0.2081	1.80	0.0237	0.20	0.1689	1.49	0.5520	4.80	0.0126	0.10
	Akanogohan	4	12.5089	10.3101	82.42	0.5474	4.37	0.2020	1.61	0.0203	0.16	0.1772	1.41	0.5474	4.37	0.0101	0.08
		5	11.7156	10.0120	84.60	0.6295	5.37	0.2232	1.90	0.0270	0.23	0.1801	1.53	0.5576	4.75	0.0159	0.13
		Moy-Aver	12.1123	10.1611	83.51	0.5884	4.87	0.2126	1.75	0.0237	0.19	0.1786	1.47	0.5525	4.56	0.0130	0.10
	Riz cuit Boiled rice	6	12.2760	10.1638	82.79	0.6615	5.38	0.2446	1.99	0.0236	0.19	0.1841	1.49	0.5576	4.53	0.0159	0.13
		7	13.4442	11.5109	85.62	0.7413	5.51	0.2171	1.61	0.0263	0.19	0.1773	1.31	0.5524	4.10	0.0103	0.08
		Moy-Aver	12.8601	10.8374	84.21	0.7014	5.44	0.2309	1.80	0.0250	0.19	0.1812	1.40	0.5550	4.31	0.0131	0.10
Tanaka	Riz cuit Boiled rice	2	8.9077	7.3339	82.33	0.5816	6.52	0.2719	3.05	0.0385	0.43	0.1654	1.85	0.6022	6.76	0.0669	0.75
		3	13.3801	11.1938	83.66	0.5474	4.09	0.2792	2.08	0.0358	0.26	0.1609	1.20	0.5961	4.45	0.0729	0.54
		Moy-Aver	11.1439	9.2639	82.99	0.5645	5.31	0.2756	2.56	0.0372	0.35	0.1622	1.53	0.5992	5.61	0.0699	0.65
	Akanogohan	4	13.2521	10.7147	80.85	0.6615	4.99	0.2719	2.05	0.0290	0.21	0.1657	1.25	0.6144	4.63	0.0398	0.30
		5	12.2558	9.5816	78.18	0.6273	5.11	0.2749	2.24	0.0270	0.22	0.1627	1.32	0.5961	4.86	0.0513	0.42
		Moy-Aver	12.7540	10.1482	79.52	0.6444	5.05	0.2734	2.15	0.0280	0.22	0.1642	1.34	0.6053	4.75	0.0456	0.36
	Riz cuit Boiled rice	6	13.1241	10.6901	81.45	0.7155	5.99	0.2539	1.93	0.0324	0.24	0.1555	1.17	0.6022	4.58	0.0251	0.24
		7	11.6516	9.7342	81.54	0.6729	5.78	0.2446	2.09	0.0304	0.26	0.1330	1.14	0.6022	5.16	0.0317	0.27
		Moy-Aver	12.3879	10.2122	82.50	0.6742	5.89	0.2493	2.01	0.0314	0.25	0.1443	1.16	0.6022	4.87	0.0284	0.26
Imai	Riz cuit Boiled rice	2	12.1638	9.8499	80.97	0.5136	4.22	0.2392	1.96	0.0263	0.21	0.1939	1.59	0.5236	4.30	0.0140	0.11
		3	12.6759	10.2333	80.73	0.4980	3.91	0.2392	1.89	0.0331	0.26	0.1896	1.49	0.5846	4.61	0.0175	0.13
		Moy-Aver	12.4199	10.0416	80.85	0.5058	4.12	0.2392	1.93	0 0302	0.24	0.1918	1.54	0.5541	4.46	0.0158	0.12
	Akanogohan	4	12.4198	9.4866	82.38	0.6045	4.86	0.2232	1.79	0.0270	0.21	0.1943	1.56	0.5326	4.28	0.0149	0.12
		5	12.3558	10.0707	81.50	0.6045	4.89	0.2262	1.83	0.0284	0.23	0.1859	1.50	0.5018	4.06	0.0129	0.10
		Moy-Aver	12.3878	9.7787	81.94	0.6045	4.88	0.2247	1.81	0.0277	0.22	0.1901	1.53	0.5172	4.17	0.0139	0.11

Sujets Subjects	Période Period	Date	Azote total Total N.	Azote de l'urée Urea N.		Azote de NH^3 Ammonia N.		Azote de l'acide urique Uric acid N.		Azote des bases puriques Purin base N.		Azote des acides aminés Amino acid N.		Azote de la créatinine Creatinin N.		Azote de la créatine Creatin N.	
		Nov.	(g)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
Ima i	Riz cuit Boiled rice	6	13.3521	10.8383	81.17	0.6273	4.69	0.2339	1.75	0.0270	0.20	0.1728	1.37	0.5103	3.82	0.0088	0.06
		7	13.5082	10.3711	76.77	0.6957	5.15	0.1930	1.42	0.0279	0.20	0.1544	1.14	0.5376	3.98	0.0098	0.07
		Moy-Aver	13.4302	10.6047	78.97	0.6615	4.92	0.2135	1.59	0.0275	0.20	0.1636	1.21	0.5205	3.90	0.0093	0.07
Shimizu	Riz cuit Boiled rice	2	12.2232	9.9967	81.78	0.6957	5.69	0.1718	1.41	0.0209	0.17	0.1769	1.44	0.4544	3.71	0.0088	0.07
		3	13.4442	10.9515	81.46	0.4904	3.64	0.2262	1.68	0.0344	0.25	0.1724	1.28	0.5326	3.96	0.0094	0.07
		Moy-Aver	12.8337	10.4741	81.62	0.5931	4.67	0.1990	1.55	0.0277	0.21	0.1747	1.36	0.4935	3.84	0.0091	0.07
	Akanogohan	4	12.2764	11.4589	80.26	0.5956	4.87	0.2871	2.01	0.0331	0.23	0.2000	1.40	0.5103	3.57	0.0133	0.09
		5	14.2124	11.8746	83.55	0.7847	5.52	0.2262	1.59	0.5311	0.21	0.1917	1.35	0.5474	3.85	0.0101	0.07
		Moy-Aver	14.2444	11.6668	81.91	0.7402	5.20	0.2567	1.80	0.0321	0.22	0.1959	1.38	0.5289	3.71	0.0117	0.08
	Riz cuit Boiled rice	6	13.1881	10.9997	83.40	0.6957	5.27	0.2305	1.74	0.0304	0.23	0.1670	1.26	0.5018	3.80	0.0085	0.06
		7	14.7246	12.0524	83.21	0.9585	6.51	0.2171	1.47	0.0317	0.21	0.1487	1.01	0.5846	3.97	0.0175	0.12
		Moy-Aver	13.9564	11.5261	83.31	0.8271	5.94	0.2238	1.61	0.0341	0.22	0.1579	1.14	0.5432	3.89	0.0130	0.09
Tanaka	Riz cuit Boiled rice	2	11.6516	9.2751	79.60	0.5816	4.99	0.1718	1.47	0.0230	0.19	0.1883	1.61	0.4741	4.06	0.0076	0.06
		3	13.1241	10.4238	79.42	0.4464	3.40	0.2262	1.72	0.0311	0.24	0.1651	1 26	0.5326	4.06	0.0149	0.11
		Moy-Aver	12.3879	9.8495	79.51	0.5140	4.20	0.1990	1.60	0.0271	0.22	0.1767	1.44	0.5034	4.06	0.0113	0.09
	Akanogohan	4	13.9563	10.7758	77.21	0.6618	4.74	0.2871	2.06	0.0223	0.16	0.1714	1.23	0.5018	3.60	0.0129	0.09
		5	12.1638	9.4662	77.82	0.7071	5.81	0.2262	1.85	0.0263	0.21	0.1743	1.43	0.4934	4.05	0.0084	0.07
		Moy-Aver	13.0601	10.1210	77.52	0.6845	5.28	0.2567	1.96	0.0243	0.19	0.1729	1.33	0.4976	3.83	0.0107	0.08
	Riz cuit	6	11.5876	9.5552	82.46	0.7071	6.10	0.2305	1.99	0.0243	0.21	0.1613	1.39	0.4934	4.25	0.0084	0.07

Daily Output of SO_3, P_2O_5, and NaCl in the Urine.

Date	Higuchi			Tanaka		
	SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	NaCl(g)
Novem.						
2	1.4669	1.2054	15.9	1.8050	1.0468	18.4
3	1.9806	1.2642	21.9	2.1095	1.4112	21.1
Moyenne — Aver.	1.7238	1.2348	18.9	1.9537	1.2290	19.8
4	1.9868	1.3377	20.3	2.0254	1.6170	25.2
5	1.9197	1.4406	22.8	1.9593	1.5288	22.9
Moyenne — Aver.	1.9533	1.3892	21.6	1.9924	1.5729	24.1
6	1.8832	1.5141	23.4	2.0176	1.4847	25.1
7	2.1549	1.3965	18.9	1.8311	1.3965	19.3
Moyenne — Aver.	2.0191	1.4553	21.2	1.9244	1.4406	22.2

Date	Imai			Shimizu			Tanaka		
	SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	NaCl(g)
Novem.									
2	1.9924	1.1760	16.7	2.0076	1.0290	19.1	1.9013	1.1907	19.9
3	1.8257	1.4700	24.3	2.0844	1.1907	20.5	1.9847	1.4994	20.4
Moyenne — Aver.	1.9091	1.3230	20.5	2.0460	1.1099	19.8	1.9430	1.3451	20.2
4	1.8153	1.4700	23.5	2.1493	1.6317	22.3	2.0481	1.4994	23.3
5	1.8921	1.3718	26.2	2.2364	1.5141	26.2	2.0419	1.3083	25.5
Moyenne — Aver.	1.8537	1.4209	24.9	2.1929	1.5729	24.3	2.0450	1.4039	24.4
6	2.0955	1.5288	20.9	1.9813	1.4994	18.4	1.8112	1.4406	20.7
7	2.0803	1.4653	21.2	2.1616	1.6611	21.3	1.9790	1.4653	26.1
Moyenne — Aver.	2.0879	1.4971	21.1	2.0715	1.5803	19.9	1.8951	1.4530	23.4

Nitrogen Balance : the Digestibility and Utilisation and Caloric Value.

Sujet / Subject	Période / Period	Absorption d'azote Moyenne journalière — N. intake Average per day — Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Azote trouvé dans l'urine Moyenne journalière — N. in urine Average per day — Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Azote trouvé dans les selles Moyenne journalière — N. in fæces Average per day — Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Gains ou pertes en azote Nitrogen balance	Absorption Moyenne journalière — Absorption Average per day — Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Calories	Pourcentage d'absorption % of absorption
Higuchi . .	Riz cuit . . . . Boiled rice . . .	13.8176	86.3599	11.5158	83.34	2.5808	18.67	— 0.2790	11.2368	70.2300	287.943	81.33
	Akanogohan . . Riz cuit . . . . Boiled rice . . .	13.7408	85.8799	12.1123	88.15	1.2843	9.35	+ 0.3442	12.4565	77.8531	319.198	90.65
		13.8176	86.3599	12.8601	93.07	2.5714	18.61	— 1.6139	11.2462	70.2888	288.184	81.39
Tanaka . .	*Idem*	14.2538	89.0862	11.1439	78.18	2.9313	20.56	+ 0.1786	11.3225	70.7656	290.139	79.44
		14.3855	89.9093	12.7540	88.66	2.7028	18.69	— 1.0713	11.6827	73.0169	299.369	81.31
		13.8176	86.3599	12.3879	89.65	2.7633	19.99	— 1.3336	11.0543	69.0894	283.267	80.01
Imai . . .	*Idem*	13.8176	86.3599	12.4199	89.88	2.1692	15.69	— 0.7715	11.6484	72.8025	298.490	84.31
		13.7408	85.8799	12.3878	90.15	2.2526	16.42	— 0.8996	11.4882	71.8013	294.385	83.58
		13.8176	86.3599	13.4302	97.19	2.5764	18.65	— 2.1908	11.2412	70.2575	288.056	81.35
Shimizu . .	*Idem*	14.4719	90.4493	12.8337	88.68	2.2147	15.45	— 0.5765	12.2572	76.6075	314.091	84.55
		14.8153	92.5955	14.2444	96.14	2.1881	14.77	— 1.6172	12.6272	78.9200	323.572	85.23
		15.1262	94.5387	13.9564	92.26	2.2935	15.16	— 1.1237	12.8327	80.2044	328.838	84.84
T. Tanaka .	*Idem*	12.9452	80.9073	12.3879	95.69	2.3885	18.45	— 1.8312	10.5567	65.9794	270.516	81.55
		13.0961	81.8505	13.0601	99.72	2.2500	17.18	— 2.2140	10.8461	67.7881	277.931	82.82
		12.7271	79.5443	12.0678	94.82	2.2989	18.06	— 1.6396	10.4282	65.1763	267.223	81.94

Digestibility and Utilisation of the Carbohydrate (as Glucose) and its Caloric Value.

Sujets Subject	Période Period	Absorption des hydrates de carbone Moy. jour. (gr.) Carbohydrate intake Average per day (gms.)	Hydrates de carb. élim. dans les selles Moyenne journal. Carbohydrate in fœces Average per day		Absorption Moyenne journalière Absorption Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
	Riz cuit . . .	494.26	1.1919	0.24	493.07	2021.587	99.76
	Boiled rice . .						
guchi .	Akanogohan .	416.02	0.6812	0.16	415.34	1702.894	99.84
	Riz cuit . . .	494.26	1.3026	0.26	492.96	2021.136	99.74
	Boiled rice . .						
		528.41	1.8106	0.34	526.60	2159.060	99.66
naka .	*Idem*	457.47	1.1939	0.26	456.28	1870.748	99.74
		494.26	1.8768	0.38	492.38	2018.758	99.62
		494.26	1.4214	0.29	492.84	2020.644	99.71
ai . .	*Idem*	416.02	1.3715	0.32	414.65	1700.065	99.68
		494.26	1.8116	0.37	492.45	2019.045	99.63
		545.49	1.6799	0.31	543.81	2229.621	99.69
imizu .	*Idem*	485.15	1.6604	0.34	483.49	1982.309	99.66
		596.71	1.8136	0.30	594.90	2439.090	99.70
		425.96	1.6163	0.38	424.34	1739.794	99.62
Tanaka	*Idem*	374.58	1.6012	0.42	372.98	1529.218	99.58
		408.89	1.8700	0.45	407.02	1668.782	99.55

Digestibility and Utilisation of Crude Fat and its Caloric Value.

Sujets Subject	Période Period	Absorption de la graisse Moy. jour. (gr.) Fat intake Average per day (gms.)	Graisse éliminée dans les selles Moyenne journal. Fat in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pourcentag d'absorptio % of absorptio
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
Higuchi .	Riz cuit . . . Boiled rice . .	19.95	1.7367	8.71	18.21	169.353	91.2
	Akanogohan .	19.65	0.7769	3.95	18.87	175.491	96.0
	Riz cuit . . . Boiled rice . .	19.95	1.8027	9.04	18.15	168.795	90.9
Tanaka	*Idem*	20.25	1.9249	9.51	18.33	170.469	90.4
		19.73	1.7760	9.00	17.95	166.935	91.0
		19.95	1.7370	8.71	18.21	169.353	91.2
Imai . .	*Idem*	19.95	2.1831	10.94	17.77	165.261	89.0
		19.65	1.7649	8.98	17.89	166.377	91.0
		19.95	1.8925	9.48	18.06	167.958	90.5
Shimizu .	*Idem*	20.40	2.0790	10.14	18.32	170.376	89.8
		19.98	1.7417	8.72	18.24	169.632	91.2
		20.85	2.0539	9.85	18.80	174.840	90.1
T. Tanaka	*Idem*	19.35	1.7672	9.13	17.58	163.494	90.8
		18.98	1.5892	8.37	17.39	161.727	91.6
		19.20	1.7720	9.23	17.43	162.099	90.7

Digestibility and Utilisation of Crude Ash.

Sujets Subject	Période Period	Absorption des cendres Moy. journ. (gr.) Ash intake Average per day (gms.)	Cendres éliminées dans les selles Moyenne journalière Ash in fæces Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	
guchi .	Riz cuit.	25.95	3.5257	13.58	86.42
	Boiled rice				
	Akanogohan	28.11	1.6634	5.92	94.08
	Riz cuit.	25.95	3.5577	13.71	86.29
	Boiled rice				
naka .	*Idem*	26.10	4.2372	17.00	83.00
		28.61	3.4626	13.11	86.89
		25.95	3.8723	14.92	85.08
ai . .	*Idem*	25.95	2.7934	10.76	89.24
		28.11	2.9608	10.53	89.47
		25.95	3.8083	14.68	85.32
mizu. .	*Idem*	26.18	2.4970	9.53	90.47
		28.94	2.6048	9.00	91.00
		26.40	2.8078	10.63	89.37
anaka.	*Idem*	25.65	2.5356	9.88	90.12
		27.62	2.5557	9.25	90.75
		25.58	2.5960	10.11	89.89

Percentage of the Caloric Value of Food actually utilised by the Body.

Sujets Subject	Période Period	Absorption des calories Moyenne journalière Calories intake Average per day		Utilisation des calories Caloric utilisation		% de quanti de calor absorb
		Calories totales Total calories	Par kg. du poids Per kg. of body weight	Calories totales Total calories	Par kg. du poids Per kg. of body weight	% agai calori intak
Higuchi .	Riz cuit	2566.077	48.89	2478.883	47.23	96.6
	Boiled rice . . .					
	Akanogohan . .	2237.745	42.66	2197.583	41.89	98.1
	Riz cuit	2566.077	48.90	2478.115	47.24	96.6
	Boiled rice . . .					
Tanaka .	*Idem*	2720.059	51.51	2619.698	49.61	96.3
		2427.744	46.02	2337.052	44.30	96.2
		2566.077	49.08	2471.378	47.27	96.3
Imai . . .	*Idem*	2566.077	48.74	2484.395	47.19	96.8
		2237.745	42.78	2160.827	41.32	96.5
		2566.077	49.63	2475.059	47.87	96.4
Shimizu .	*Idem*	2797.071	49.17	2714.088	47.71	97.0
		2554.670	44.94	2475.513	43.54	96.9
		3028.025	53.28	2942.768	51.78	97.1
T. Tanaka	*Idem*	2258.111	46.27	2173.804	44.54	96.2
		2047.879	42.01	1968.876	40.38	96.1
		2181.141	44.97	2098.104	43.26	96.1

Percentage of the Digestibility and Utilisation of Each Constituent.

Période Period	Azote total Total nitrogen %	Hydrates de carbone comme le glycose Carbo-hydrate as glucose %	Graisse brute Crude fat %	Cendres brutes Crude ash %	Calories %
iz cuit — Boiled rice	82.236	99.688	90.314	87.850	96.602
kanogohan	84.718	99.700	92.196	90.438	96.812
iz cuit — Boiled rice	81.906	99.648	90.738	87.190	96.546

lusion.

1. The digestibility and utilisation of each constituent were slightly better ıg the " Akanogohan " period (except in the case of the carbohydrate utilisation). e was not much difference in the amount of energy supplied.

2. The ratio of total urine nitrogen to nitrogen intake could not be compared e two periods, because the nitrogen balance was frequently negative; but the idual nitrogenous compounds were usually present in physiological proportions; ercentage of uric acid nitrogen in the urine decreased slightly during the anogohan " period.

3. The amounts of boiled rice and of " Akanogohan " eaten were almost ame during the two periods. The output of fæces (wet and air-dried) was almost ame in the two periods.

Experiment VI (*b*).

arison of the Digestibility and Utilisation of " Akanogohan " and Ordinary Boiled Rice.

he Akanogohan was prepared by the subjects themselves. Red beans were with 500 cc. of water for one hour during the evening preceding the experiment earthenware cooker. Each morning of the " Akanogohan " period a definite ity of polished rice was added to the boiled red beans (red beans 1: polished and the mixture was again cooked. This " Akanogohan " was divided into portions and made three meals for each subject.

Daily Output of the Total Nitrogen and the Distribution of Nitrogenous Constituents in the Urine.

Sujets Subjects	Période Period	Date Sept.	Azote total Total N. (g)	Azote de l'urée Urea N. (g)	Azote de l'urée Urea N. (%)	Azote de NH^3 Ammonia N. (g)	Azote de NH^3 Ammonia N. (%)	Azote de l'acide urique Uric acid N. (g)	Azote de l'acide urique Uric acid N. (%)	Azote des bases puriques Purin base N. (g)	Azote des bases puriques Purin base N. (%)	Azote des acides aminés Amino acid N. (g)	Azote des acides aminés Amino acid N. (%)	Azote de la créatinine Creatinin N. (g)	Azote de la créatinine Creatinin N. (%)	Azote de la créatine Creatin N. (g)	Azote de la créatine Creatin N. (%)
Shimizu	Riz cuit Boiled rice	16	9.4612	6.5069	68.77	0.5237	5.54	0.1802	1.90	0.0144	0.15	0.2092	2.21	0.5059	5.34	0.0087	0.09
		17	9.8708	7.6172	77.17	0.4549	4.61	0.1698	1.72	0.0352	0.36	0.1720	1.74	0.5474	5.55	0.0101	0.12
		Moy-Aver	9.6660	7.0621	72.97	0.4883	5.08	0.1750	1.81	0.0248	0.20	0.1906	1.98	0.5267	5.44	0.0094	0.15
	Akanogohan	18	8.3267	6.3412	76.16	0.5100	6.12	0.2325	2.79	0.0228	0.27	0.1825	2.19	0.5474	6.57	0.0101	0.12
		19	9.9259	7.8379	78.96	0.4135	4.17	0.1711	1.72	0.0310	0.31	0.2101	2.12	0.5576	5.62	0.0159	0.16
		Moy-Aver	9.1263	7.0896	77.56	0.4618	5.14	0.2018	2.26	0.0269	0.29	0.1963	2.15	0.5525	6.10	0.0130	0.14
	Riz cuit Boiled rice	20	10.0996	7.8728	77.95	0.4549	4.50	0.1730	1.71	0.0189	0.18	0.1977	1.96	0.5410	5.36	0.0132	0.13
		21	9.7329	7.0343	72.28	0.4725	4.85	0.2052	2.11	0.0214	0.22	0.2044	2.10	0.5474	5.62	0.0153	1.16
		Moy-Aver	9.9162	7.4536	74.66	0.4637	4.68	0.1891	1.91	0.0202	0.20	0.2011	2.03	0.5442	5.49	0.0148	0.14
Imai	Riz cuit Boiled rice	16	9.8983	7.2957	72.69	0.5100	5.15	0.1709	1.73	0.0172	0.17	0.1729	1.75	0.4934	4.98	0.0126	0.12
		17	9.1815	7.2238	78.68	0.6065	6.61	0.1643	1.79	0.0172	0.19	0.1710	1.86	0.5376	5.84	0.0098	0.10
		Moy-Aver	9.5399	7.2418	75.69	0.5583	5.88	0.1676	1.76	0.0172	0.18	0.1719	1.80	0.5155	5.41	0.0117	0.11
	Akanogohan	18	10.1177	8.2716	81.76	0.5642	5.58	0.2386	2.36	0.0296	0.29	0.1931	1.91	0.5236	5.18	0.0090	0.09
		19	9.3193	7.7202	82.85	0.4273	4.59	0.1958	2.10	0.0228	0.24	0.1998	2.14	0.5236	5.62	0.0140	0.15
		Moy-Aver	9.7185	7.9959	81.82	0.4958	5.08	0.2172	2.23	0.0262	0.27	0.1965	2.03	0.5236	5.40	0.0115	0.12
	Riz cuit Boiled rice	20	9.9851	7.5547	75.66	0.5237	5.24	0.2141	2.15	0.0203	0.20	0.1921	1.92	0.5149	5.16	0.0089	0.09
		21	9.4021	7.8304	83.26	0.4962	5.28	0.2178	2.32	0.0186	0.20	0.1864	1.99	0.5018	5.34	0.0129	0.14
		Moy-Aver	9.6936	7.6926	79.47	0.5099	5.26	0.2159	2.23	0.0195	0.20	0.1893	1.96	0.5039	5.25	0.0109	0.11

Sujets Subjects	Période Period	Date	Azote total Total N.	Azote de l'urée Urea N.		Azote de NH^3 Ammonia N.		Azote de l'acide urique Uric acid N.		Azote des bases puriques Purin base N.		Azote des acides aminés Amino acid N.		Azote de la créatinine Creatinin N.		Azote de la créatine Creatin N.	
		Sept.	(g)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
Nishibori	Riz cuit Boiled rice	16	9.4296	7.1825	76.28	0.5376	5.70	0.1585	1.68	0.0228	0.24	0.1991	2.11	0.4632	4.93	0.0072	0.08
		17	10.1465	7.9407	78.26	0.5927	5.84	0.1782	1.76	0.0255	0.25	0.2059	2.03	0.5018	4.95	0.0129	0.13
		Moy-Aver	9.7881	7.5616	77.27	0.5652	5.77	0.1684	1.72	0.0241	0.25	0.2025	2.07	0.4825	4.94	0.0097	0.10
	Akanogohan	18	11.9938	9.5812	79.97	0.5514	4.60	0.2141	1.79	0.0283	0.24	0.2048	1.70	0.5236	4.37	0.0090	0.08
		19	10.7807	8.3404	77.37	0.6065	5.62	0.2213	2.05	0.0159	0.15	0.1707	1.58	0.5236	4.86	0.0140	0.13
		Moy-Aver	11.3872	8.9608	78.67	0.5789	5.11	0.2177	1.97	0.0171	0.19	0.1878	1.69	0.5236	4.61	0.0115	0.10
	Riz cuit Boiled rice	20	10.3946	7.6098	73.21	0.5100	4.91	0.1730	1.66	0.0145	0.14	0.1887	1.81	0.4704	4.53	0.0113	0.11
		21	10.5601	8.1061	76.67	0.5376	5.09	0.2202	2.09	0.0207	0.20	0.1944	1.84	0.4817	4.56	0.0078	0.07
		Moy-Aver	10.4773	7.8579	74.94	0.5218	5.00	0.1966	1.82	0.0176	0.17	0.1916	1.83	0.4762	4.54	0.0096	0.09
Hirata	Riz cuit Boiled rice	16	10.5601	7.5575	71.57	0.5652	5.35	0.1822	1.73	0.0255	0.24	0.1725	1.63	0.4632	4.39	0.0109	0.10
		17	10.0638	7.5547	75.06	0.6203	6.16	0.1876	1.86	0.0207	0.21	0.1612	1.60	0.4817	4.79	0.0117	0.12
		Moy-Aver	10.3119	7.5561	73.32	0.5928	5.76	0.1849	1.79	0.0231	0.22	0.1669	1.62	0.4730	4.59	0.0113	0.11
	Akanogohan	18	10.4498	7.9447	76.03	0.5514	5.28	0.1995	1.91	0.0199	0.19	0.1768	1.69	0.5018	4.80	0.0129	0.12
		19	12.8210	10 2114	79.65	0.5927	4.62	0.1444	1.12	0.0241	0.19	0.2168	1.69	0.4934	3.85	0.0126	0.10
		Moy-Aver	11.6354	9.0781	77.84	0.5721	4.95	0.1719	1.26	0.0220	0.19	0.1968	1.69	0.4976	4.33	0.0128	0.11
	Riz cuit Boiled rice	20	9.4612	7.6781	81.16	0.5376	5.68	0.1703	1.80	0.0117	0.12	0.1869	1.98	0.4704	4.96	0.0113	0.12
		21	9.2366	7.2653	78.66	0.4135	4.48	0.1802	1.95	0.0203	0.22	0.1699	1.84	0.4955	5.36	0.0112	0.12
		Moy-Aver	9.3489	7.4721	79.91	0.4756	5.08	0.1753	1.87	0.0160	0.17	0.1874	1.91	0.4830	5.16	0.0113	0.12

Daily Output of SO_3, P_2O_5, and NaCl in the Urine.

Période Period	Date	Shimizu			Imai	
		SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)
Riz cuit Boiled rice	Sept. 16	1.4543	1.4202	18.2	1.3842	1.1716
	17	1.5655	1.5216	22.8	1.3088	1.1209
	Moyenne –Aver.	1.5099	1.4709	20.5	1.3465	1.1469
Akanogohan	18	1.3890	1.8665	21.3	1.4365	1.6535
	19	1.5943	1.6484	21.7	1.4763	1.2376
	Moyenne –Aver.	1.4917	1.7574	21.5	1.4564	1.4445
Riz cuit Boiled rice	20	1.5026	1.8077	22.2	1.3815	1.6940
	21	1.6443	1.3492	23.6	1.3494	1.4495
	Moyenne –Aver.	1.5735	1.5784	22.9	1.3655	1.5717

Période Period	Date	Nishibori			Hirata	
		SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)
Riz cuit Boiled rice	Sept. 16	1.4481	1.4100	16.6	1.5840	1.2680
	17	1.7040	1.5013	19.8	1.5723	1.4363
	Moyenne –Aver.	1.5761	1.4556	18.2	1.5782	1.3521
Akanogohan	18	1.8584	1.8593	23.4	1.6478	1.3694
	19	1.8921	1.6636	21.2	2.1485	1.3621
	Moyenne –Aver.	1.8753	1.7614	22.3	1.8982	1.3657
Riz cuit Boiled rice	20	1.7967	1.5774	22.8	1.4200	1.2883
	21	1.6263	1.2071	20.4	1.4145	1.5657
	Moyenne –Aver.	1.7115	1.3922	21.6	1.4173	1.4270

Sujets Subject	Période Period	Absorption d'azote Moyenne journalière N. intake Average per day		Azote trouvé dans l'urine Moyenne journalière N. in urine Average per day		Azote trouvé dans les selles Moyenne journalière N. in fæces Average per day		Gains ou pertes en azote Nitrogen balance	Absorption Moyenne journalière Absorption Average per day			Pourcentage d'absorption % of absorption
		Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake		Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Calories	
Shimizu . .	Riz cuit	14.3420	89.6408	9.6660	67.32	1.6082	11.21	+ 2.9678	12.7338	79.5863	326.304	88.79
	Boiled rice . . .											
	Akanogohan . .	15.0865	94.2969	9.1263	60.49	3.9180	25.97	+ 1.0422	11.1685	69.8031	286.193	74.03
	Riz cuit	14.5692	91.0638	9.9162	68.06	2.4229	16.64	+ 2.2301	12.1463	75.9144	311.249	83.36
	Boiled rice . . .											
		14.7964	92.4838	9.5399	64.47	2.4898	16.83	+ 2.7667	12.3067	76.9169	315.359	83.17
Imai . . .	*Idem*	15.0865	94.2969	9.7185	64.41	3.1246	20.71	+ 2.2434	11.9619	74.7619	306.524	79.29
		14.5692	91.0638	9.6936	66.53	2.2637	15.54	+ 2.6119	12.3055	76.9094	315.329	84.46
		13.6594	85.3838	9.7881	71.65	2.4009	17.58	+ 1.4704	11.2585	70.3656	288.499	82.42
Nishibori .	*Idem*	14.6074	91.2963	11.3872	77.95	2.6676	18.26	+ 0.5426	11.9398	74.6238	305.958	81.74
		14.1148	88.2288	10.4773	74.23	2.3850	16.90	+ 1.2525	11.7298	73.3113	300.576	83.10
		13.6594	85.3838	10.3119	75.42	2.3198	16.98	+ 1.0277	11.3396	70.8725	290.577	83.02
Hirata. . .	*Idem*	14.1162	88.2326	11.6354	83.13	2.6276	18.61	— 0.1468	11.4886	71.8038	294.396	81.39
		13.6594	85.3838	9.3489	68.44	1.6991	12.44	+ 2.6114	11.9603	74.7519	306.483	87.56

Digestibility and Utilisation of the Carbohydrate (as Glucose) and its Caloric Value

Sujets / Subject	Période / Period	Absorption des hydrates de carbone Moy. jour. (gr.) Carbohydrate intake Average per day (gms.)	Hydrates de carb. élim. dans les selles Moyenne journal. Carbohydrate in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pou centa d'ab sorpt % of a sorpt
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
Shimizu .	Riz cuit . . . Boiled rice . .	518.720	1.5170	0.29	517.203	2120.532	99.
	Akanogohan .	514.552	3.5260	0.69	511.026	2095.207	99.
	Riz cuit . . . Boiled rice . .	530.610	1.8352	0.35	528.775	2167.978	99.
Imai . .	*Idem*	552.500	2.3630	0.43	550.137	2255.562	99.
		514.552	2.5621	0.50	511.990	2099.159	99.
		530.610	2.1828	0.41	528.427	2166.541	99.
Nishibori.	*Idem*	473.050	1.9321	0.41	471.918	1934.864	99.
		482.756	1.8729	0.39	480.883	1971.620	99.
		506.830	0.8431	0.17	505.987	2074.547	99.
Hirata .	*Idem*	473.050	1.7505	0.37	471.300	1932.330	99.
		450.960	2.7040	0.60	448.256	1837.850	99.
		473.050	1.2192	0.26	471.831	1934.507	99.

Digestibility and Utilisation of Crude Fat and its Caloric Value.

Sujets / Subject	Période / Period	Absorption de la graisse Moy. jour. (gr.) Fat intake Average per day (gms.)	Graisse éliminée dans les selles Moyenne journal. Fat in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
	Riz cuit . . . Boiled rice . .	17.123	1.0969	6.41	16.026	149.042	93.59
mizu .	Akanogohan .	18.235	2.6082	14.30	15.627	145.331	85.70
	Riz cuit . . . Boiled rice . .	17.262	1.1279	6.53	16.134	150.046	93.47
		17.400	1.4406	8.28	15.959	148.419	91.72
ai . .	*Idem*	18.235	2.5492	13.98	15.686	145.880	86.02
		17.262	1.9542	11.32	15.308	142.364	88.68
		16.708	1.8973	11.36	14.811	137.742	88.64
hibori.	*Idem*	17.890	1.3329	7.45	16.557	153.980	92.55
		16.985	1.4627	8.61	15.522	144.355	91.39
		16.708	2.5826	15.46	14.125	131.363	84.54
ata .	*Idem*	17.545	2.8510	16.25	14.694	136.654	83.75
		16.708	1.5277	9.14	15.180	141.174	90.86

Digestibility and Utilisation of Crude Ash.

Sujets Subject	Période Period	Absorption des cendres Moy. journ. (gr.) Ash intake Average per day (gms.)	Cendres éliminées dans les selles Moyenne journalière Ash in fæces Average per day Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Pourcenta d'ab- sorptio % of absorpti
Shimizu. .	Riz cuit.	27.442	1.8056	6.58	93.42
	Boiled rice				
	Akanogohan	28.358	4.2484	14.98	85.02
	Riz cuit.	27.538	2.6285	9.94	90.06
	Boiled rice				
Imai . .	*Idem*	27.633	2.5997	9.41	90.59
		28.358	3.0451	10.74	89.26
		27.538	2.8925	10.50	89.50
Nishibori .	*Idem*	27.156	2.7916	10.28	89.7
		28.109	2.5710	9.15	90.8
		27.347	2.8910	10.57	89.4
Hirata . .	*Item*	27.156	2.6460	9.74	90.2
		27.861	3.5840	12.86	87.1
		27.156	2.7388	10.09	89.9

Percentage of the Caloric Value of Food actually utilised by the Body.

Sujets Subject	Période Period	Absorption des calories Moyenne journalière Calories intake Average per day		Utilisation des calories Caloric utilisation		% de la quantité de calories absorbée % against calories intake
		Calories totales Total calories	Par kg. du poids Per kg. of body weight	Calories totales Total calories	Par kg. du poids Per kg. of body weight	
imizu .	Riz cuit . . . . Boiled rice . . .	2653.524	46.84	2595.878	45.82	97.82
	Akanogohan . . Riz cuit . . . . Boiled rice . . .	2665.866 2709.399	47.02 47.74	2526.731 2629.273	44.55 46.33	94.75 97.05
ai . .	*Idem*	2806.254 2665.866 2709.399	53.25 50.25 50.93	2719.340 2551.563 2624.234	51.60 48.09 49.32	96.90 95.70 96.85
hibori	*Idem*	2444.963 2519.992 2597.681	49.79 50.96 52.48	2361.105 2431.558 2519.478	48.09 49.17 50.90	96.58 96.48 96.98
ata . .	*Idem*	2444.963 2373.858 2444.963	51.36 49.87 50.93	2354.270 2268.900 2382.164	49.46 47.66 49.64	96.30 95.57 97.46

Digestibility and Utilisation of Each Constituent.

Période Period	Azote total Total nitrogen %	Hydrates de carbone comme le glycose Carbo-hydrate as glucose %	Graisse brute Crude fat %	Cendres brutes Crude ash %	Calories %
Riz cuit — Boiled rice	84.350	99.625	89.623	90.997	96.900
Akanogohan	79.112	99.455	87.005	88.067	95.625
Riz cuit — Boiled rice	84.620	99.702	91.100	89.722	97.082

Conclusion.

1. The digestibility and utilisation of each constituent were better wl boiled rice was used than when " Akanogohan " was used, except in one ca The amount of energy supplied was greater during the boiled-rice period than dur the " Akanogohan " period.

2. There was not much variation in the percentage of total nitrogen in urine during the two periods and the individual nitrogenous compounds in the ur remained almost constant, except that the ratio of urea nitrogen to total ur nitrogen was slightly increased during the " Akanogohan " period.

3. The amount eaten (reckoned as uncooked rice) was the same in each peri but the output of fæces was greater when " Akanogohan " was used.

In the previous experiment, the digestibility of " Akanogohan " cooked o with the juice of red beans was slightly better than that of ordinary boiled r but in this experiment the digestibility of " Akanogohan " cooked with whole beans was poorer than that of ordinary boiled rice.

Experiment VII.

Comparison of the Digestibility and Utilisation of " Okowa " with Ordinary Boiled R

For the preparation of " Okowa " 7 " go " of glutinous rice were mixed w 3 " go " of non-glutinous rice. The mixture was then washed and soaked in 2,000 of water for 24 hours. The water was removed the next morning, and the was steamed in boiling water (3,500 cc.) for 45 minutes.

Sujets Subjects	Période Period	Date	Azote total Total N.	Azote de l'urée Urea N.		Azote de NH³ Ammonia N.		Azote de l'acide urique Uric acid N.		Azote des bases puriques Purin base N.		Azote des acides aminés Amino acid N.		Azote de la créatinine Creatinin N.		Azote de la créatine Creatin N.	
			(g)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
Kayano	Riz cuit Boiled rice	Nov. 28	11.2682	8.0970	71.86	0.5136	4.56	0.2446	2.17	0.0277	0.25	0.1845	1.64	0.5376	4.77	0.0098	0.09
		29	11.9084	9.0698	76.25	0.7250	6.09	0.2294	1.93	0.0270	0.23	0.1551	1.31	0.5474	4.59	0.0101	0.09
		Moy-Aver	11.5883	8.5834	74.06	0.6193	5.33	0.2370	2.05	0.0274	0.24	0.1698	1.48	0.5425	4.68	0.0100	0.09
	Okowa	30	10.7553	8.1499	75.77	0.5018	4.67	0.2567	2.39	0.0270	0.25	0.2167	2.01	0.5282	4.91	0.0095	0.09
		Dec. 1	11.5876	8.9323	77.09	0.6273	5.41	0.2243	1.94	0.0209	0.18	0.1758	1.52	0.5326	4.59	0.0149	0.13
		Moy-Aver	11.1715	8.5411	76.43	0.5646	5.04	0.2305	2.17	0.0240	0.22	0.1963	1.77	0.5304	4.75	0.0122	0.11
	Riz cuit Boiled rice	2	11.9717	9.2349	77.14	0.6295	5.26	0.2446	2.04	0.0277	0.23	0.1807	1.51	0.5149	4.30	0.0089	0.07
		3	12.7399	9.5621	75.05	0.5702	4.48	0.3123	2.45	0.0250	0.19	0.1848	1.45	0.5282	4.15	0.0095	0.08
		Moy-Aver	12.3558	9.3985	76.10	0.5999	4.87	0.2782	2.25	0.0264	0.21	0.1828	1.48	0.5216	4.23	0.0092	0.08
Sakaguchi	Riz cuit Boiled rice	Nov. 28	11.2035	8.7415	78.02	0.5702	5.09	0.2539	2.27	0.0182	0.16	0.1729	1.54	0.5474	4.88	0.0101	0.09
		29	10.8834	8.3685	76.89	0.7071	6.49	0.2305	2.12	0.0196	0.18	0.1729	1.58	0.5376	4.94	0.0098	0.09
		Moy-Aver	11.0435	8.5550	77.46	0.6387	5.79	0.2422	2.20	0.0189	0.17	0.1729	1.56	0.5425	4.91	0.0100	0.09
	Okowa	30	11.0754	8.2868	74.82	0.7702	6.95	0.3113	2.81	0.0236	0.21	0.1426	1.29	0.5474	4.94	0.0101	0.09
		Dec. 1	10.8193	8.8319	81.63	0.6045	5.59	0.2689	2.48	0.0230	0.21	0.1699	1.57	0.5018	4.64	0.0129	0.12
		Moy-Aver	10.9374	8.5594	78.23	0.6874	6.27	0.2901	2.65	0.0233	0.21	0.1563	1.43	0.5246	4.79	0.0115	0.11
	Riz cuit Boiled rice	2	10.6913	7.9532	74.39	0.6501	6.08	0.2689	2.51	0.0224	0.21	0.1574	1.47	0.5149	4.89	0.0135	0.12
		3	11.5236	8.2660	71.73	0.7527	6.53	0.2505	2.17	0.0236	0.21	0.1617	1.40	0.5326	4.62	0.0101	0.09
		Moy-Aver	11.1075	8.1096	73.06	0.7014	6.31	0.2597	2.34	0.0230	0.21	0.1596	1.44	0.5238	4.76	0.0118	0.11
Imai	Riz cuit Boiled rice	Nov. 28	12.4288	9.8724	79.43	0.6273	5.05	0.2810	2.26	0.0270	0.22	0.1950	1.57	0.5282	4.25	0.0145	0.12
		29	13.3404	10.2183	81.99	0.6975	5.65	0.2359	1.91	0.0250	0.20	0.1902	1.54	0.5149	4.17	0.0135	0.11
		Moy-Aver	12.8846	10.0454	80.71	0.6624	5.35	0.2585	2.09	0.0260	0.21	0.1926	1.56	0.5216	4.21	0.0140	0.12
	Okowa	30	12.5722	10.1720	80.91	0.6045	4.81	0.2539	2.02	0.0257	0.20	0.1597	1.27	0.5018	3.99	0.0129	0.10
		Dec. 1	13.9806	11.1216	79.55	0.6956	4.97	0.2749	1.97	0.0277	0.19	0.1641	1.17	0.5576	3.99	0.0159	0.11
		Moy-Aver	13.2764	10.6468	80.23	0.6501	4.89	0.2644	2.00	0.0267	0.20	0.1619	1.22	0.5297	3.99	0.0144	0.11

(Continuation.)

Sujets Subjects	Période Period	Date	Azote total Total N. (g)	Azote de l'urée Urea N. (g)	(%)	Azote de NH_3 Ammonia N. (g)	(%)	Azote de l'acide urique Uric acid N. (g)	(%)	Azote des bases puriques Purin base N. (g)	(%)	Azote des acides aminés Amino acid N. (g)	(%)	Azote de la créatinine Creatinin N. (g)	(%)	Azote de la créatine Creatin N. (g)	(%)
Imai	Riz cuit Boiled rice	Dec. 2	11.8680	9.6098	80.97	0.6501	5.47	0.2020	1.70	0.0250	0.21	0.1637	1.38	0.5018	4.23	0.0129	0.11
		3	12.4045	9.6230	77.58	0.7413	5.98	0.2596	2.09	0.0277	0.22	0.1675	1.35	0.5326	4.28	0.0149	0.12
		Moy-Aver	12.1363	9.6164	79.28	0.6957	5.73	0.2308	1.90	0.0264	0.22	0.1656	1.37	0.5172	4.26	0.0139	0.12
Shimizu	Riz cuit Boiled rice	Nov. 28	10.6913	7.9788	74.63	0.4464	4.18	0.2658	2.49	0.0290	0.27	0.1253	1.17	0.5018	4.69	0.0085	0.08
		29	9.9871	7.8939	79.05	0.6295	6.30	0.1718	1.72	0.0243	0.24	0.1611	1.61	0.4934	4.94	0.0126	0.13
		Moy-Aver	10.3392	7.9365	76.84	0.5380	5.24	0.2188	2.11	0.0267	0.26	0.1432	1.39	0.4976	4.82	0.0106	0.11
	Okowa	30	13.4442	10.8204	80.48	0.6501	4.83	0.2622	1.85	0.0270	0.20	0.1530	1.14	0.4895	3.64	0.0123	0.09
		Dec. 1	14.5965	10.3894	71.18	0.7071	4.84	0.2509	1.72	0.0284	0.19	0.1816	1.24	0.5236	3.59	0.0140	0.09
		Moy-Aver	14.0204	10.6049	75.83	0.6786	4.84	0.2566	1.79	0.0277	0.20	0.1673	1.19	0.5066	3.62	0.0132	0.09
	Riz cuit Boiled rice	2	13.6605	10.4303	76.35	0.8896	6.51	0.2262	1.66	0.0311	0.23	0.1574	1.15	0.5236	3.83	0.0090	0.07
		3	13.7246	11.0459	80.48	0.9369	6.82	0.3174	2.31	0.0304	0.22	0.1502	1.09	0.5282	3.85	0.0095	0.07
		Moy-Aver	13.6926	10.7381	78.42	0.9133	6.67	0.2718	1.99	0.0308	0.23	0.1538	1.12	0.5259	3.84	0.0093	0.07
Tanaka	Riz cuit Boiled rice	Nov. 28	9.8591	7.8452	79.57	0.5949	6.03	0.2385	2.42	0.0250	0.25	0.1491	1.51	0.4817	4.88	0.0078	0.08
		29	12.8040	10.7608	84.04	0.6939	5.42	0.2567	2.01	0.0311	0.24	0.1670	1.31	0.5018	3.92	0.0129	0.10
		Moy-Aver	11.3316	9.3030	81.81	0.6444	5.73	0.2476	2.22	0.0281	0.25	0.1581	1.41	0.4918	4.40	0.0104	0.09
	Okowa	30	11.5236	9.1570	79.48	0.6192	5.37	0.2234	1.94	0.0270	0.23	0.1483	1.29	0.5018	4.27	0.0085	0.07
		Dec. 1	11.0114	8.6650	78.69	0.6939	6.30	0.2116	1.92	0.0250	0.23	0.1578	1.43	0.4704	4.27	0.0113	0.10
		Moy-Aver	11.2675	8.9110	79.09	0.6566	5.84	0.2175	1.93	0.0260	0.23	0.1531	1.36	0.4861	4.27	0.0099	0.09
	Riz cuit	2	9.9231	7.7540	78.14	0.5194	5.23	0.1930	1.99	0.0270	0.27	0.1632	1.64	0.4856	4.89	0.0120	0.12
														0.5059	4.34	0.0087	0.07

Daily Output of SO_3, P_2O_5, and NaCl in the Urine.

Date	Kayano			Sakaguchi		
	SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	NaCl(g)
Nov. 28	1.7537	1.5232	22.8	1.6736	1.3756	20.2
29	1.7088	1.6565	24.0	1.6172	1.4280	21.7
Moyenne –Aver.	1.7313	1.5899	23.4	1.6454	1.4018	21.0
Nov. 30	1.5773	1.3138	25.1	1.7961	1.1424	23.1
Dec. 1	1.7159	1.1424	25.5	1.5238	0.9520	24.1
Moyenne –Aver.	1.6466	1.2281	25.3	1.6600	1.0472	23.6
Dec. 2	1.7207	1.3519	24.1	1.6081	1.2186	26.3
3	1.9778	1.5613	26.3	1.7669	1.4851	26.4
Moyenne –Aver.	1.8493	1.4566	25.2	1.6875	1.3519	26.4

Date	Imai			Shimizu			Tanaka		
	SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	NaCl(g)
Nov. 28	1.9209	2.1134	19.8	1.5705	2.1325	18.6	1.5070	1.7326	19.9
29	1.8654	1.7898	22.8	1.6056	1.6184	24.4	1.8832	2.0944	22.1
Moyenne –Aver.	1.8932	1.9516	21.3	1.5881	1.8755	21.5	1.6951	1.9135	21.0
Nov. 30	1.8679	1.7898	21.8	2.0903	1.9040	24.8	1.6802	1.6755	25.0
Dec. 1	2.0826	1.3518	27.7	2.2782	1.4470	25.8	1.6307	1.4470	25.9
Moyenne –Aver.	1.9753	1.5708	24.8	2.1843	1.6755	25.3	1.6555	1.5618	25.5
Dec. 2	1.9202	1.7516	19.2	1.9664	1.8278	21.4	1.4932	1.5613	19.2
3	1.7154	1.8849	25.2	2.1184	1.9992	28.9	1.6836	1.6946	26.5
Moyenne –Aver.	1.8174	1.8183	22.2	2.0424	1.9135	25.2	1.5884	1.6280	22.9

Nitrogen Balance : the Digestibility and Utilisation, and Caloric Value.

Sujets Subject	Période Period	Absorption d'azote Moyenne journalière N. intake Average per day		Azote trouvé dans l'urine Moyenne journalière N. in urine Average per day		Azote trouvé dans les selles Moyenne journalière N. in fæces Average per day		Gains ou pertes en azote Nitrogen balance	Absorption Moyenne journalière Absorption Average per day			Pourcentage d'absorption % of absorption
		Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake		Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Calories	
Kayano . .	Riz cuit	13.2536	82.8349	11.5883	87.43	1.8650	14.06	— 0.1997	11.3886	71.1788	291.833	85.94
	Boiled rice . . .											
	Okowa	13.8451	86.5318	11.1715	80.69	2.0573	14.86	+ 0.6163	11.7878	73.6738	302.063	85.14
	Riz cuit	13.2536	82.8349	12.3558	93.22	1.7943	13.54	— 0.8965	11.4593	71.6206	293.644	86.46
	Boiled rice . . .											
Sakaguchi .	*Idem*	13.6428	85.2647	11.0435	80.95	2.0317	14.89	— 0.5676	11.6111	72.5694	297.535	85.11
		15.0193	93.8705	10.9374	72.16	2.4057	16.02	+ 1.6762	12.6136	78.8350	323.224	83.98
		13.6428	85.2674	11.1075	81.42	2.1573	15.81	+ 0.3780	11.4855	71.7844	294.316	84.19
Imai . . .	*Idem*	13.2586	82.8349	12.8846	97.21	2.0244	15.19	— 1.6554	11.2292	70.1725	287.707	84.81
		14.1397	88.3730	13.2764	93.90	2.6223	18.54	— 1.7590	11.5174	71.9838	295.134	81.46
		14.0320	87.6999	12.1363	86.49	2.4568	17.50	— 0.5611	11.5752	72.3450	296.615	82.50
Shimizu . .	*Idem*	14.4212	90.1324	10.3392	71.69	2.4363	16.89	+ 1.6457	11.9849	74.9056	307.113	83.11
		16.1896	12.1843	14.0204	86.60	2.4951	15.41	— 0.3259	13.6947	85.5919	350.927	84.59
		14.4212	90.1324	13.6926	94.95	2.3048	15.98	— 1.5762	12.1164	75.7275	310.483	84.02
Tanaka . .	*Idem*	12.6698	79.1862	11.3316	89.44	2.4981	19.71	— 1.6599	10.1717	63.5731	260.650	80.29
		13.2640	82.8999	11.2675	84.94	2.5415	19.16	— 0.5450	10.7225	67.0156	274.764	80.84
		13.0590	80.6217	10.7874	82.60	2.1658	16.58	+ 0.1058	10.8932	68.0825	279.138	83.42

Digestibility and Utilisation of the Carbohydrate (as Glucose) and its Caloric Value.

Sujets / Subject	Période / Period	Absorption des hydrates de carbone Moy. jour. (gr.) Carbohydrate intake Average per day (gms.)	Hydrates de carb. élim. dans les selles Moyenne journal. Carbohydrate in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
ayano .	Riz cuit . . . Boiled rice . .	451.90	1.7633	0.39	450.14	1845.574	99.61
	Okowa. . . .	406.92	1.4800	0.36	405.44	1662.304	99.64
	Riz cuit . . . Boiled rice . .	451.90	1.6715	0.37	450.23	1845.943	99.63
kaguchi	*Idem*	482.52	1.9141	0.39	480.61	1970.501	99.61
		490.80	1.8672	0.38	488.93	2004.613	99.62
		482.52	2.0788	0.43	480.44	1969.804	99.57
ai . .	*Idem*	451.90	2.0271	0.44	449.87	1844.467	99.56
		435.39	2.0770	0.47	433.31	1776.571	99.53
		513.14	2.4631	0.48	510.68	2093.788	99.52
mizu .	*Idem*	543.76	2.1796	0.40	541.58	2220.478	99.60
		564.68	1.4930	0.26	563.19	2309.079	99.74
		543.76	1.8439	0.34	541.94	2221.954	99.66
naka .	*Idem*	405.97	2.3444	0.57	403.63	1654.883	99.43
		379.98	2.1566	0.56	377.82	1549.062	99.44
		436.59	2.2971	0.53	434.29	1780.589	99.47

Digestibility and Utilisation of Crude Fat and its Caloric Value.

Sujets Subject	Période Period	Absorption de la graisse Moy. jour. (gr.) Fat intake Average per day (gms.)	Graisse éliminée dans les selles Moyenne journal. Fat in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pou centa d'ab sorpt
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	% of a sorpt
Kayano .	Riz cuit . . . Boiled rice . .	19.47	1.7452	8.96	17.72	164.796	91.
	Okowa. . . .	18.15	2.0285	11.17	16.12	149.916	88.
	Riz cuit . . . Boiled rice . .	19.47	1.5415	7.97	17.93	166.749	92.
Sakaguchi	*Idem*	19.73	1.5202	7.70	18.21	169.353	92.
		18.55	1.8609	10.03	16.69	155.217	89.
		19.73	1.7130	8.68	18.02	167.586	91.
Imai . .	*Idem*	19.47	1.7221	8.84	17.75	165.075	91.
		18.25	1.9004	10.41	16.35	152.055	89.
		19.99	1.7281	8.64	18.26	169.818	91.
Shimizu .	*Idem*	20.25	2.0082	9.91	18.24	169.632	90.
		18.95	2.2404	11.82	16.71	155.403	88.
		20.25	1.7820	8.80	18.47	171.771	91.
Tanaka .	*Idem*	19.08	1.9722	10.33	17.11	159.123	89.
		17.95	1.9611	10.92	15.99	148.707	89.
		19.34	1.4285	7.38	17.91	166.563	92.

Digestibility and Utilisation of Crude Ash.

Sujets Subject	Période Period	Absorption des cendres Moy. journ. (gr.) Ash intake Average per day (gms.)	Cendres éliminées dans les selles Moyenne journalière Ash in fæces Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	
ayano .	Riz cuit.	25.47	2.6249	10.30	89.70
	Boiled rice				
	Okowa	25.32	3.0150	11.90	88.10
	Riz cuit.	25.47	2.5463	10.00	90.00
	Boiled rice				
gaguchi	*Idem*	25.58	2.4675	9.64	90.36
		25.58	3.0250	11.82	88.18
		25.58	2.7597	10.79	89.21
ai . .	*Idem*	25.47	2.6376	10.35	89.65
		25.39	3.4525	13.59	86.41
		25.69	3.2240	12.25	87.75
mizu. .	*Idem*	25.80	2.8945	11.21	88.79
		25.84	2.9350	11.36	88.64
		25.80	2.8658	11.10	88.90
naka .	*Idem*	25.31	2.8305	11.18	88.82
		25.19	2.7288	10.83	89.17
		25.42	2.6898	10.58	89.42

Percentage of the Caloric Value of Food actually utilised by the Body.

Sujets Subject	Période Period	Absorption des calories Moyenne journalière Calories intake Average per day		Utilisation des calories Caloric utilisation		% de quanti de calor absorb
		Calories totales Total calories	Par kg. du poids Per kg. of body weight	Calories totales Total calories	Par kg. du poids Per kg. of body weight	% agai calorie intak
Kayano .	Riz cuit	2373.484	46.63	2302.201	45.23	97.0
	Boiled rice . . .					
	Okowa	2232.947	43.78	2114.283	41.46	94.7
	Riz cuit	2373.484	46.54	2306.336	45.22	97.1
	Boiled rice . . .					
Sakaguchi	*Idem*	2511.417	45.45	2437.389	44.12	97.0
		2569.664	46.01	2483.054	44.46	96.6
		2511.417	44.96	2431.706	43.54	96.8
Imai . . .	*Idem*	2373.484	46.04	2297.249	44.60	96.8
		2397.153	46.37	2223.760	43.01	92.7
		2649.350	51.87	2560.221	49.57	95.5
Shimizu .	*Idem*	2787.284	47.81	2697.223	46.26	96.7
		2906.279	50.02	2815.409	48.46	96.8
		2787.284	47.94	2704.208	46.58	97.0
Tanaka .	*Idem*	2166.584	43.92	2074.656	42.05	95.7
		2064.743	42.11	1972.533	40.23	95.5
		2300.430	46.73	2226.290	45.22	96.8

Digestibility and Utilisation of Each Constituent.

Période Period	Azote total Total nitrogen %	Hydrates de carbone comme le glycose Carbo-hydrate as glucose %	Graisse brute Crude fat %	Cendres brutes Crude ash %	Calories %
iz cuit — Boiled rice	83.852	99.562	90.852	89.464	96.688
kowa	83.202	99.594	89.140	88.100	95.298
iz cuit — Boiled rice	84.118	99.570	91.706	89.056	96.702

clusion.

1. The digestibility and utilisation of " Okowa " were not so good as regards l nitrogen, crude fat, and crude ash as ordinary boiled rice; with respect to ohydrate there was no difference between them. The amount of energy supplied slightly less during the " Okowa " period.

2. The amount of " Okowa " eaten was less than that of boiled rice, but the al quantity reckoned as uncooked rice was larger when " Okowa " was used.

3. The ratio of total nitrogen in the urine to total nitrogen intake decreased tly during the " Okowa " period.

4. There was no great difference in the output of fæces during the two periods, the ratio of air-dried quantity to wet quantity was larger during the " Okowa " od.

Experiment VIII.

mparison of the Digestibility and Utilisation of " Okowa " with " Mochi ".

" Okowa " was prepared by the same method as in Experiment VII, but this we used only glutinous rice.

For the preparation of "Mochi" 1 "to" (equal to 3.9703 gallons) of washed inous rice was soaked in water for 24 hours; the water was drained off, and the was steamed in the same manner as in making "Okowa". The "Mochi" was e by the special method of "pounding"; it was then rolled out on a flat surface l it was about 2 cm. in thickness. After cooling to room temperature it was cut small pieces (100 gms. each), which were boiled before use.

Daily Output of the Total Nitrogen and the Distribution of Nitrogenous Constituents in the Urine.

Sujets Subjects	Période Period	Date	Azote total Total N. (g)	Azote de l'urée Urea N. (g)	(%)	Azote de NH^3 Ammonia N. (g)	(%)	Azote de l'acide urique Uric acid N. (g)	(%)	Azote des bases puriques Purin base N. (g)	(%)	Azote des acides aminés Amino acid N. (g)	(%)	Azote de la créatinine Creatinin N. (g)	(%)	Azote de la créatine Creatin N. (g)	(%)
Narita	Okowa	Fév.-Feb. 4	9.5359	7.5300	78.96	0.5480	5.74	0.1989	2.08	0.0137	0.14	0.1829	1.92	0.3542	3.71	0.0064	0.07
		5	10.0017	7.8506	78.49	0.4384	4.38	0.2323	2.32	0.0196	0.19	0.1892	1.89	0.3501	3.50	0.0083	0.08
		Moy-Aver	9.7688	7.6903	78.73	0.4932	5.06	0.2156	2.20	0.0167	0.17	0.1861	1.91	0.3522	3.61	0.0074	0.08
	Mochi	6	11.0704	8.2863	74.87	0.4110	3.71	0.2020	1.82	0.0137	0.12	0.1951	1.85	0.3542	3.20	0.0064	0.06
		7	10.2758	8.0415	78.25	0.4110	4.00	0.1747	1.70	0.0144	0.14	0.2056	2.00	0.3521	3.42	0.0106	0.10
		Moy-Aver	10.6731	8.1639	76.56	0.4110	3.86	0.1884	1.76	0.0141	0.13	0.2004	1.93	0.3532	3.31	0.0085	0.08
	Okowa	8	10.7142	8.7439	81.61	0.4521	4.22	0.1965	1.83	0.0163	0.15	0.1416	1.32	0.3584	3.34	0.0020	0.02
		9	10.6594	8.3001	77.86	0.3973	3.72	0.2135	2.00	0.0170	0.16	0.1755	1.65	0.3501	3.30	0.0083	0.08
		Moy-Aver	10.6868	8.5220	79.74	0.4247	3.97	0.2050	1.92	0.0167	0.16	0.1586	1.49	0.3543	3.32	0.0052	0.05
Abe	Okowa	4	9.6181	7.1245	74.07	0.5206	5.41	0.2080	2.16	0.0178	0.18	0.1888	1.96	0.4153	4.31	0.0088	0.09
		5	10.7690	8.0918	75.14	0.4604	4.27	0.2213	2.05	0.0130	0.12	0.2011	1.86	0.4240	3.93	0.0061	0.05
		Moy-Aver	10.1936	7.6082	74.61	0.4905	4.84	0.2147	2.11	0.0154	0.15	0.1950	1.91	0.4197	4.12	0.0075	0.07
	Mochi	6	11.4814	8.3822	73.00	0.4384	3.82	0.2719	2.37	0.0184	0.16	0.2124	1.85	0.4301	3.74	0.0126	0.11
		7	10.4402	7.6177	72.96	0.4685	4.48	0.1941	1.85	0.0164	0.16	0.2115	2.02	0.4014	3.84	0.0110	0.10
		Moy-Aver	10.9608	8.0000	72.98	0.4535	4.15	0.2330	2.11	0.0174	0.16	0.2120	1.94	0.4158	3.79	0.0118	0.11
	Okowa	8	11.3170	8.6946	76.83	0.4932	4.36	0.1820	1.60	0.0144	0.13	0.1771	1.56	0.4460	3.94	0.0067	0.06
		9	11.1391	8.5672	76.91	0.4795	4.30	0.2450	2.20	0.0171	0.15	0.1813	1.62	0.4211	3.78	0.0091	0.08
		Moy-Aver	11.2281	8.6309	76.87	0.4864	4.33	0.2135	1.90	0.0158	0.14	0.1792	1.59	0.4336	3.86	0.0079	0.07

Sujets Subjects	Période Period	Date	Azote total Total N. (g)	Azote de l'urée Urea N. (g)	Azote de l'urée Urea N. (%)	Azote de NH^3 Ammonia N. (g)	Azote de NH^3 Ammonia N. (%)	Azote de l'acide urique Uric acid N. (g)	Azote de l'acide urique Uric acid N. (%)	Azote des bases puriques Purin base N. (g)	Azote des bases puriques Purin base N. (%)	Azote des acides aminés Amino acid N. (g)	Azote des acides aminés Amino acid N. (%)	Azote de la créatinine Creatinin N. (g)	Azote de la créatinine Creatinin N. (%)	Azote de la créatine Creatin N. (g)	Azote de la créatine Creatin N. (%)
Kato		Fév.-Feb.															
	Okowa	4	9.9523	8.2841	83.24	0.4932	4.96	0.2356	2.36	0.0233	0.24	0.2065	2.08	0.4817	4.84	0.0078	0.07
		5	11.8377	9.4044	79.45	0.5361	4.56	0.3184	2.69	0.0219	0.19	0.2129	1.79	0.5018	4.24	0.0085	0.07
		Moy-Aver	10.8950	8.8443	81.35	0.5147	4.76	0.2770	2.53	0.0226	0.22	0.2097	1.94	0.4918	4.54	0.0082	0.07
	Mochi	6	12.0982	9.2659	76.59	0.5069	4.19	0.2780	2.39	0.0219	0.18	0.2360	1.95	0.5103	4.32	0.0184	0.15
		7	12,0843	9.4838	78.64	0.5480	4.54	0.2644	2.18	0.0178	0.15	0.2173	1.80	0.5018	4.15	0.0085	0.07
		Moy-Aver	12.0913	9.3749	77.62	0.5275	4.37	0.2712	2.29	0.0199	0.17	0.2267	1.88	0.5061	4.24	0.0135	0.11
	Okowa	8	12.0708	9.2084	76.28	0.4658	3.86	0.2208	1.83	0.0171	0.14	0.2242	1.86	0.5103	4.22	0.0088	0.07
		9	12.5227	10.2318	81.71	0.4558	3.64	0.2523	2.00	0.0197	0.16	0.2047	1.64	0.4934	3.94	0.0126	0.10
		Moy-Aver	12.2968	9.7201	79.00	0.4608	3.75	0.2366	1.92	0.0184	0.15	0.2145	1.75	0.5019	4.58	0.0107	0.09
Tanaka	Okowa	4	9.5494	7.8602	82.31	0.4658	4.87	0.1395	1.46	0.0178	0.18	0.2006	2.10	0.4895	5.12	0.0123	0.13
		5	10.6046	8.4041	79.25	0.5152	4.85	0.2749	2.59	0.0164	0.15	0.1951	1.83	0.4934	4.65	0.0126	0.12
		Moy-Aver	10.0770	8.1322	80.78	0.4905	4.86	0.2072	2.03	0.0171	0.17	0.1979	1.97	0.4915	4.89	0.0125	0.13
	Mochi	6	10.6594	8.3151	78.01	0.4247	3.97	0.2719	2.54	0.0199	0.19	0.2183	2.04	0.4632	4.34	0.0072	0.07
		7	10.9334	3.5480	78.18	0.4521	4.15	0.2474	2.26	0.0191	0.17	0.1880	1.72	0.4817	4.40	0.0078	0.07
		Moy-Aver	10.7964	8.4316	78.10	0.4384	4.06	0.2597	2.40	0.0195	0.18	0.2032	1.88	0.4725	4.37	0.0075	0.07
	Okowa	8	10.6868	8.4260	79.00	0.4384	4.10	0.2183	2.04	0.0137	0.13	0.1947	1.82	0.4460	4.17	0.0067	0.06
		9	10.6184	8.5699	80.07	0.4932	4.65	0.2305	2.28	0.0199	0.19	0.1872	1.76	0.4704	4.42	0.0113	0.10
		Moy-Aver	10.6526	8.4980	79.54	0.4658	4.38	0.2244	2.16	0.0168	0.16	0.1910	1.79	0.4582	4.30	0.0090	0.08

The Daily Output of SO_3, P_2O_5, and NaCl in the Urine.

Période Period	Date	Narita			Abe		
		SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	
Okowa	Fév.-Feb. 4	1.4491	1.5434	17.7	1.5597	1.2608	
	5	1.7376	1.6738	21.7	1.7331	1.7390	
	Moyenne — Aver.	1.5934	1.6086	19.7	1.6464	1.4999	
Mochi	6	1.6602	1.4130	20.0	1.6177	2.0216	
	7	1.8474	1.2825	20.4	1.7630	1.8912	
	Moyenne — Aver.	1.7538	1.3478	20.2	1.6904	1.9564	
Okowa	8	1.7301	1.4130	21.8	1.8296	1.9564	
	9	1.7219	1.4347	22.2	1.7992	1.8043	
	Moyenne — Aver.	1.7260	1.4239	22.0	1.8144	1.8804	

Période Period	Date	Kato			Tanaka		
		SO_3(g)	P_2O_5(g)	NaCl(g)	SO_3(g)	P_2O_5(g)	
Okowa	Fév.-Feb. 4	1.5366	1.1086	19.1	1.5843	1.6956	
	5	1.7555	1.9129	16.3	1.7023	1.9347	
	Moyenne — Aver.	1.6461	1.5108	17.7	1.6433	1.8152	
Mochi	6	1.8742	1.4999	17.6	1.6341	1.7608	
	7	1.7777	1.5651	19.7	1.8180	1.8260	
	Moyenne — Aver.	1.8260	1.5325	18.7	1.7261	1.7934	
Okowa	8	1.9394	1.6738	21.9	1.7058	1.9347	
	9	1.8886	1.5434	24.2	1.6662	1.8695	
	Moyenne — Aver.	1.9190	1.6086	23.1	1.6860	1.9021	

Sujets Subject	Période Period	Absorption d'azote Moyenne journalière N. intake Average per day		Azote trouvé dans l'urine Moyenne journalière N. in urine Average per day		Azote trouvé dans les selles Moyenne journalière N. in fæces Average per day		Gains ou pertes en azote Nitrogen balance	Absorption Moyenne journalière Absorption Average per day			Pourcentage d'absorption % of absorption
		Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake		Azote (gr.) Nitrogen (gms.)	Protéine (gr.) Protein (gms.)	Calories	
Narita . . .	Okowa	11.8847	74.2793	9.7688	82.19	2.5578	21.52	— 0.4419	9.3269	58.2931	239.002	78.48
	Mochi	12.7460	79.6624	10.6731	83.74	2.1523	16.88	— 0.0794	10.5937	66.2106	271.463	83.12
	Okowa	11.7747	73.5918	10.6868	90.76	2.5495	21.65	— 1.4616	9.2252	57.6575	236.396	78.35
Abe . . .	Okowa	11.8847	74.2793	10.1936	85.77	2.5277	21.26	— 0.8366	9.3570	58.4813	239.773	78.74
	Mochi	13.4398	83.9987	10.9608	81.55	1.9263	14.33	+ 0.5527	11.5135	71.9594	295.034	85.67
	Okowa	11.4445	71.5280	11.2281	98.11	1.8563	16.22	— 1.6399	9.5882	59.9263	245.698	83.78
Kato . . .	Okowa	12.1048	75.6549	10.8950	90.01	2.0112	16.61	— 0.8014	10.0936	63.0850	258.649	83.39
	Mochi	13.4398	83.9987	12.0913	90.00	1.6652	12.39	— 0.3167	11.7746	73.5913	301.724	87.61
	Okowa	12.3249	77.0305	12.2968	99.77	2.3769	19.28	— 2.3488	9.9480	62.1750	254.918	80.78
Tanaka . .	Okowa	11.6646	72.9037	10.0770	86.39	2.3208	19.89	— 0.7332	9.3438	58.3988	239.435	80.11
	Mochi	13.0929	81.8305	10.7964	82.46	2.0454	15.62	+ 0.2511	11.0475	68.8469	282.272	84.38
	Okowa	11.2244	70.1524	10.6526	94.90	1.8721	16.68	— 1.3003	9.3523	58.4519	239.653	83.32

Digestibility and Utilisation of the Carbohydrate (as Glucose) and its Caloric Valu

Sujets / Subject	Période / Period	Absorption des hydrates de carbone Moy. jour. (gr.) Carbohydrate intake Average per day (gms.)	Hydrates de carb. élim. dans les selles Moyenne journal. Carbohydrate in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pou centa d'al sorpt % of a sorpt
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
Narita	Okowa	307.59	1.1228	0.36	306.47	1256.527	99.(
	Mochi	363.64	1.3329	0.36	362.31	1485.471	99.(
	Okowa	300.16	1.4495	0.48	298.71	1224.711	99.3
Abe	Okowa	307.59	1.3153	0.42	306.27	1255.707	99.3
	Mochi	410.17	1.1609	0.28	409.01	1676.941	99.7
	Okowa	277.84	1.0437	0.38	276.80	1134.880	99.(
Kato	Okowa	322.46	1.0728	0.33	321.39	1317.699	99.(
	Mochi	410.17	0.7726	0.19	409.40	1678.540	99.3
	Okowa	337.34	1.4438	0.42	335.90	1377.190	99.
Tanaka	Okowa	292.71	1.4700	0.50	291.24	1194.084	99.
	Mochi	386.91	1.4967	0.38	385.41	1580.181	99.
	Okowa	262.96	1.2298	0.47	261.73	1073.093	99.

Digestibility and Utilisation of Crude Fat and its Caloric Value.

Sujets / Subject	Période / Period	Absorption de la graisse Moy. jour. (gr.) Fat intake Average per day (gms.)	Graisse éliminée dans les selles Moyenne journal. Fat in fæces Average per day		Absorption Moyenne journalière Absorption Average per day		Pourcentage d'absorption % of absorption
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	Quantité (gr.) Quantity (gms.)	Calories	
rita .	Okowa. . . .	17.85	1.9594	10.97	15.89	147.777	89.03
	Mọchi	18.27	1.0021	5.48	17.27	160.611	94.52
	Okowa. . . .	17.80	1.3393	7.52	16.46	153.078	92.48
e . . .	Okowa. . . .	17.85	2.3411	13.11	15.51	144.243	86.89
	Mochi	18.59	1.5246	8.20	17.07	158.751	91.80
	Okowa. . . .	17.65	1.7966	10.18	15.85	147.405	89.82
to . .	Okowa. . . .	17.95	2.0294	11.30	15.92	148.056	88.70
	Mochi	18.59	1.4635	7.87	17.13	159.309	92.13
	Okowa. . . .	18.05	1.9721	10.92	16.08	149.544	89.08
ıaka .	Okowa. . . .	17.75	2.4429	13.76	15.31	142.383	86.24
	Mochi	18.43	1.7063	9.25	16.72	155.496	90.75
	Okowa. . . .	17.55	1.6648	9.49	15.89	147.777	90.51

Digestibility and Utilisation of Crude Ash.

Sujets Subject	Période Period	Absorption des cendres Moy. journ. (gr.) Ash intake Average per day (gms.)	Cendres éliminées dans les selles Moyenne journalière Ash in fæces Average per day		Pourcen d'ab sorpti
			Quantité (gr.) Quantity (gms.)	% de la quantité absorbée % against intake	% o absorp
Narita . .	Okowa	24.98	3.2873	13.16	86.8
	Mochi	25.17	2.4063	9.56	90.4
	Okowa	24.95	3.1160	12.49	87.5
Abe . . .	Okowa	24.98	3.3148	13.27	86.7
	Mochi	25.34	2.0466	8.08	91.9
	Okowa	24.87	2.3562	9.47	90.5
Kato . . .	Okowa	25.03	2.9805	11.90	88.1
	Mochi	25.34	2.7642	10.90	89.1
	Okowa	25.05	3.6402	14.51	85.4
Tanaka .	Okowa	24.92	3.2376	12.98	87.0
	Mochi	25.26	2.3182	9.17	90.8
	Okowa	24.81	2.3989	9.67	90.3

Percentage of the Caloric Value of Food actually utilised by the Body.

Sujets Subject	Période Period	Absorption des calories Moyenne journalière Calories intake Average per day		Utilisation des calories Caloric utilisation		% de la quantité de calories absorbée % against calories intake
		Calories totales Total calories	Par kg. du poids Per kg. of body weight	Calories totales Total calories	Par kg. du poids Per kg. of body weight	
	Okowa	1371.669	39.67	1643.306	37.64	94.88
rita . .	Mochi	1987.451	45.95	1890.545	43.71	95.13
	Okowa	1697.881	39.25	1614.185	37.32	95.08
	Okowa	1731.669	34.11	1639.723	32.32	94.75
e . . .	Mochi	2198.979	43.77	2130.726	42.21	96.43
	Okowa	1596.554	31.90	1527.983	30.52	95.67
	Okowa	1799.206	33.33	1724.404	31.94	95.83
to . .	Mochi	2198.979	40.94	2139.573	39.83	97.29
	Okowa	1866.784	34.81	1781.652	33.22	95.43
	Okowa	1664.091	33.92	1575.902	32.12	94.70
naka .	Mochi	2093.235	42.85	2017.949	41.31	96.40
	Okowa	1528.976	31.43	1460.523	30.02	95.51

Digestibility and Utilisation of Each Constituent.

Période Period	Azote total Total nitrogen %	Hydrates de carbone comme le glycose Carbo-hydrate as glucose %	Graisse brute Crude fat %	Cendres brutes Crude ash %	Calories %
kowa	80.180	99.598	87.715	87.172	95.040
ochi	85.170	99.698	92.300	90.572	96.312
kowa	81.542	99.562	90.472	89.407	95.422

usion.

. The digestibility and utilisation of each constituent were better during "Mochi" period than during the "Okowa" period. The amount of energy ied was greater during the "Mochi" period.

2. Less "Mochi" was eaten than "Okowa", but the actual quantity reckoned ms of uncooked rice was larger during the "Mochi" period.

3. The output of total nitrogen and the ratio of the various nitrogenous ounds in the urine to total urine nitrogen showed no definite changes during vo periods, except that the ratio of urea nitrogen to total urine nitrogen decreased ly during the "Mochi" period.

. The output of fæces was slightly larger (wet quantity) during the "Mochi" l.

9.

IE BIOLOGICAL VALUE OF THE NITROGENOUS BSTANCES FOUND IN OUR MAIN VEGETABLE FOODS.

By Kaichi Furumi

siological Institute of the Medical Department of the Imperial University, Tokyo — Dr. Hisomu Nagai, Director).

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oteins are substances containing nitrogen, and can be found in various different s of foods. They differ both in quantity and quality in various foods and their iological value to an organism depends upon their chemical composition.
I have determined the biological values of the proteins contained in a number ods; the results of my experiments are as follows:

Table I.

Aliment Food	N. absorbé Nitrogen absorbed	N. éliminé dans l'urine Nitrogen in urine	Différence Balance
z (glacé) — Rice (polished)	4.152	5.390	— 0.878
z (demi glacé) — Rice (half-polished).	5.018	5.890	— 0.872
z (non glacé) — Rice (unpolished) .	5.047	5.597	— 0.550
ge — Barley	5.963	6.856	— 0.893
tate douce — Sweet potato	0.704	5.226	— 4.522
ryo	1.041	4.591	— 3.550
llet	7.561	8.126	— 0.565

n almost all cases nitrogen equilibrium was maintained.
statement of the degree of absorption and of the biological value of the ins of the above foods is given in Table II.

Table II.

Food		Nitrogen absorbed %	Biological va
Rice (polished)	Exp. No. I . .	100.0	81.68
	Exp. No. VI .	87.5	
Rice (half-polished)		83.3	93.25
Rice (unpolished)		75.4	66.08
Barley		75.1	66.21
Sweet potato		56.8	81.41
Koryo		17.6	41.08
Millet		86.9	56.86

10.

BIOCHEMICAL STUDIES ON RICE.

Differences in the Physico-chemical Properties of the Protein Oryzenin as it occurs in Glutinous and in Common Rice.

By Tetsutaro Tadokoro, Yukihiko Nakamura and Shukichi Watanabe

om the Agricultural Chemical Laboratory of the Agricultural College of Hokkaido Imperial University, Sapporo).

Introduction.

Many authors who have studied the chemical nature of glutinous and common have deduced that the differences between these rices are mainly due to the ico-chemical properties of their starches. We believe that the two different anisms of starch formation are due to the particular physiological processes on in the two varieties of rice plants. If so, the difference in the physiological esses is due primarily to the physico-chemical properties of the proteins (the ipal constituents of the protoplasm) and in particular to the properties of enin, the main protein of rice. If oryzenin is not a simple chemical substance, should be able to find differences between samples of this substance obtained glutinous and common rices just as one finds differences between the starches e two varieties.

I. Water and Ash Content of Oryzenin.

Table I.

	Oryzénine du riz commun Common rice oryzenin				Oryzénine du riz glutineux Glutinous rice oryzenin			
	Eau Water %	Cendres Ash %	Soufre Sulphur %	Phosphore Phosphorus %	Eau Water %	Cendres Ash %	Soufre Sulphur %	Phosphore Phosphorus %
ita . . .	2.550	0.493	0.892	0.166	2.400	0.369	0.779	0.188
chu . . .	3.850	0.564	0.828	0.162	4.250	0.418	0.777	0.186
ahikawa .	5.700	0.599	0.745	0.153	4.700	0.502	0.695	0.175
rogo . . .	5.340	0.498	0.635	0.167	5.950	0.374	0.596	0.189
itama . .	9.269	0.318	0.809	0.103	3.432	0.291	0.771	0.168
aragi . .	7.692	0.303	0.773	0.101	4.233	0.294	0.681	0.174
higo . . .	8.807	0.373	0.749	0.095	4.423	0.314	0.654	0.164

II. Iso-electric Point of Oryzenin.

If a difference were discovered between the iso-electric points of the oryz of glutinous and common rices, it could be assumed that there are quantitativ qualitative differences among the constituent amino-acids and at the same ti difference in the condensing conditions of such amino-acids. The authors comp the iso-electric points of the two oryzenins by means of the following experim

Table II.

Change of Surface Tension of Oryzenins dissolved in Buffer Solutions.

PH de la solution tampon / PH value of buffer solution	4.6	4.8	5.0	5.2	5.4	5.
Méthode électrique / Electrical method (m. volt) 18° C.	522	550	565	571	581	59
PH calculé d'après les données ci-dessus en m. v. / PH calculated from above m. v.	4.67	5.18	5.43	5.51	5.70	5.
Tension superficielle à 16° C. / Surface tension (16° C.)	dy /cm	dy /cm	dy /cm	dy /cm	dy /cm	dy /
Saitama						
Commun — Common	61.2	62.5	62.5	*64.2*	62.5	6
Glutineux—Glutinous	61.2	*63.9*	62.5	63.2	63.2	6
Echigo						
Commun — Common	61.8	61.2	61.8	61.8	*63.2*	6
Glutineux—Glutinous	61.2	*62.2*	61.8	61.8	61.8	6
Ibaragi						
Commun — Common	61.2	61.8	60.5	*64.2*	63.9	6
Glutineux—Glutinous	61.8	*63.2*	61.2	61.2	61.2	6
Asahikawa						
Commun — Common	62.5	61.9	61.2	60.5	*64.2*	6
Glutineux—Glutinous	62.5	61.8	*63.9*	62.5	61.9	6
Shonai						
Commun — Common	62.5	61.8	61.8	62.5	*63.2*	6
Glutineux—Glutinous	61.2	*62.5*	61.2	61.2	61.2	6
Etchu						
Commun — Common	62.5	62.5	61.9	62.5	62.2	*6*
Glutineux—Glutinous	63.2	63.2	*64.2*	63.2	61.9	6
Akita						
Commun — Common	63.9	63.2	62.5	63.2	*64.2*	6
Glutineux—Glutinous	63.9	63.2	*64.2*	63.2	62.5	6
Hyogo						
Commun — Common	61.9	62.5	62.5	63.2	*64.2*	6
Glutineux—Glutinous	62.5	61.5	*63.2*	62.5	61.9	6

nge of Viscosity of Oryzenins dissolved in Buffer Solutions. Viscosity (flowing time, 15° C.).

itama						
Commun — Common	1′ 21.8″	1′ 21.8″	1′ 21.8″	*1′ 21.9″*	1′ 22.0″	1′ 22.8″
Glutineux—Glutinous	1′ 21.8″	*1′ 19.8″*	1′ 20.0″	1′ 20.4″	1′ 21.2″	1′ 20.8″
higo						
Commun — Common	1′ 16.8″	1′ 17.2″	1′ 17.2″	1′ 16.8″	*1′ 16.2″*	1′ 17.2″
Glutineux—Glutinous	1′ 17.0″	*1′ 15.8″*	1′ 16.8″	1′ 16.8″	1′ 16.8″	1′ 17.0″
aragi						
Commun — Common	1′ 21.8″	1′ 21.2″	1′ 21.4″	*1′ 20.2″*	1′ 21.6″	1′ 22.0″
Glutineux—Glutinous	1′ 21.8″	*1′ 20.8″*	1′ 21.0″	1′ 21.2″	1′ 21.8″	1′ 22.0″
onai						
Commun — Common	1′ 16.8″	1′ 17.4″	1′ 16.8″	1′ 17.4″	*1′ 16.4″*	1′ 17.8″
Glutineux—Glutinous	1′ 16.8″	1′ 15.8″	*1′ 15.0″*	1′ 15.8″	1′ 16 8″	1′ 16.8″
chu						
Commun — Common	1′ 24.2″	1′ 23.6″	1′ 24.2″	1′ 23.8″	1′ 23.6″	*1′ 22.8″*
Glutineux—Glutinous	1′ 23.4″	1′ 23.8″	*1′ 23.2″*	1′ 24 8″	1′ 25.0″	1′ 25.4″
ita						
Commun — Common	1′ 26.6″	1′ 25.8″	1′ 25.4″	1′ 25.2″	*1′ 24.2″*	1′ 26.8″
Glutineux—Glutinous	1′ 26.4″	1′ 25.8″	*1′ 24.4″*	1′ 25.4″	1′ 24.8″	1′ 25.2″
hikawa						
Commun — Common	1′ 21.6″	1′ 21.6″	1′ 21.4″	1′ 22.0″	*1′ 21.0″*	1′ 22.2″
Glutineux—Glutinous	1′ 20.8″	1′ 20.8″	*1′ 20.0″*	1′ 21.2″	1′ 21.2″	1′ 21.2″

The table shows that, in the same kind of rice protein solution, the PH values aximum surface tension and minimum viscosity were approximately the same es produced in different provinces. The difference in the PH values of the ectric points in the two kinds of oryzenin is 0.07-0.52; glutinous rice proteins ore acidic than common rice proteins. However, slight differences can be between the iso-electric points of common rice proteins produced in different s. The iso-electric point of common rice protein is on the alkaline side; it has a r PH value than the glutinous. The protein of the former contains a larger rtion of the amino groups than carboxyl groups.

III. Other Physico-chemical Properties.

(a) *The Solubility of Oryzenin in Alkali Solution.*

The authors confirmed the observation that common rice oryzenins are more lt to dissolve in alkali solution than glutinous rice oryzenins.

(b) *The Refractive Index of Oryzenin Alkali Solution.*

ryzenin was dissolved in 1/10 normal NaOH solution so that the solution ned 7.5 per cent oryzenin. The refractive index of the solution was examined ans of Ferry's refractometer at 25-26° C.

Table III.

The Refractive Indices of Various Oryzenins in Alkali.

Kind of rice	Toyama		Niigata		Mie	
	Common	Glutinous	Common	Glutinous	Common	Gluti
Refractive index	1.3460	1.3432	1.3448	1.3435	1.3465	1.3
Its difference	0.0028		0.0013		0.0022	

The table shows that the refractive index of common rice protein is al higher than that of the glutinous.

(c) *The Specific Rotatory Power of Oryzenin Alkali Solution.*

Table IV.

Specific Rotatory Power of Various Oryzenins dissolved in Alkali.

Espèce de riz / Kind of rice		0.1 gr. dans 15 c.c. de: 0.1 gm. in 15 c.c. of:			
		Soude en solution N /25 1 /25 normal NaOH		Soude décinorma 1 /10 normal NaO	
Saitama	Commun — Common .	— 64.875	— 2.5	— 77.850	—
	Glutineux — Glutinous	— 59.685	— 2.3	— 59.685	—
Ibaragi	Commun — Common .	— 60.982	— 2.35	— 80.445	—
	Glutineux — Glutinous	— 54.480	— 2.1	— 60.982	—
Shonai	Commun — Common .	— 62.205	— 2.4	— 75.255	—
	Glutineux — Glutinous	— 59.685	— 2.3	— 60.982	—
Echigo	Commun — Common .	— 63.577	— 2.45	— 67.470	—
	Glutineux — Glutinous	— 60.982	— 2.35	— 62.205	—
Akita	Commun — Common .	— 62.205	— 2.4	— 76.552	—
	Glutineux — Glutinous	— 55.792	— 2.15	— 58.387	—
Etchu	Commun — Common .	— 62.205	— 2.4	— 75.255	—
	Glutineux — Glutinous	— 51.900	— 2.0	— 54.480	—
Asahikawa	Commun — Common .	— 59.685	— 2.3	— 62.205	—
	Glutineux — Glutinous	— 49.305	— 1.9	— 53.197	—
Hyogo	Commun — Common .	— 60.982	— 2.35	— 71.362	—
	Glutineux — Glutinous	— 51.900	— 2.0	— 55.792	—

The rotatory power of the alkali oryzenin solution of common rice is g than that of glutinous rice. In the presence of much alkali the rotatory power former increases more than that of the latter.

IV. Determination of the Quantities of HCl that combine with Ory

It may be said that, in a given concentration of HCl, the amount of HC bining with the added protein is proportional to the number of free amino gr the protein.

The authors calculated the quantity of HCl combining with protein from the owing formula:

$$\frac{C}{C'} = \frac{\log A - \log (A-X)}{\log A - \log (A-X')}.$$

Table V.

Combining Power of Oryzenins with HCl.

Espèce de riz Kind of rice		HCl à l'état libre HCl in free state (mg.)	HCl en combinaison HCl in combined state (mg.)
ıkita	Commun — Common.	13.903	4.312
	Glutineux — Glutinous . . .	14.818	3 .417
ltchu	Commun — Common.	13.337	4.898
	Glutineux — Glutinous . . .	13.604	4.613
ısahikawa	Commun — Common.	14.253	3.982
	Glutineux — Glutinous . . .	15.642	2.582
aitama	Commun — Common.	16.251	1.984
	Glutineux — Glutinous . . .	16.709	1.526
baragi	Commun — Common.	16.526	1.909
	Glutineux — Glutinous . . .	16.940	1.295
lchigo	Commun — Common.	16.470	1.765
	Glutineux — Glutinous . . .	16.935	1.300

In the case of common rice oryzenin, the quantity of HCl combined is always ter than in the case of glutinous. This is further evidence that the free amino p predominates in the former as compared with the latter.

V. The Elementary Composition of the Oryzenins.

Table VI.

Elementary Composition of Oryzenin and Ratio of Carbon to Oxygen.

Espèce de riz Kind of rice		Azote Nitrogen %	Hydrogène Hydrogen %	Carbone Carbon %	Oxygène Oxygen %	Pourcentage Ratio %
ita	Commun — Common .	18.33	9.61	52.35	18.85	2.777
	Glutineux — Glutinous	17.59	8.72	51.04	21.89	2.331
chu	Commun — Common .	17.86	9.80	51.98	19.54	2.659
	Glutineux — Glutinous	16.86	8.62	49.83	23.99	2.077
ahikawa	Commun — Common.	17.30	8.76	51.85	21.39	2.424
	Glutineux — Glutinous	16.22	8.35	50.59	24.18	2.092
ogo	Commun — Common .	18.64	8.27	53.15	19.31	2.751
	Glutineux — Glutinous	17.67	7.47	51.45	22.80	2.256
tama	Commun — Common .	19.31	8.83	55.74	15.31	3.640
	Glutineux — Glutinous	18.38	7.12	50.67	23.06	2.197
ıragi	Commun — Common .	19.07	8.73	50.45	20.98	2.404
	Glutineux — Glutinous	18.02	7.65	48.48	25.17	1.926
nigo	Commun — Common .	18.45	8.31	50.96	21.53	2.366
	Glutineux — Glutinous	17.50	7.55	45.63	29.67	1.537

The nitrogen content of common rice oryzenin is about 1 per cent higher t that of glutinous rice oryzenin. This is why the alkalinity of the former is gre than that of the latter. The lower ratio of carbon to oxygen of the glutinous oryzenin as compared with that of the common rice oryzenin confirms the dominance of the acidity and of the carboxyl groups in the former.

VI. Separation and Determination of Amino Acids.

The following table shows the percentages of the various forms of nitr as determined by Van Slyke's method.

Table VII.

Percentages of Nitrogen formed when Oryzenin was hydrolysed with HCl.

Espèce de riz Kind of rice	Azote total Total N	Azote combinée sous forme de:						
		Ammoniaque Ammonia N	Mélanine Melanin N	Acides monoaminés Monoamino N	Acides diaminés Diamino N	Arginine Arginin N	Lysine Lysin N	Histidine Histidin N
Akita								
Commun — Common .	100	9.732	2.234	41.680	46.371	30.638	5.335	9.476
Glutineux — Glutinous	100	7.311	2.319	44.002	46.350	25.668	3.149	16.253
Etchu								
Commun — Common .	100	9.143	2.447	43.897	44.530	26.337	3.107	12.167
Glutineux — Glutinous	100	8.879	2.111	45.907	43.114	21.150	2.384	18.398
Asahikawa								
Commun — Common .	100	9.826	1.983	52.312	35.890	16.404	10.347	7.913
Glutineux — Glutinous	100	7.108	1.962	53.167	37.657	16.868	6.381	11.954
Hyogo								
Commun — Common .	100	9.105	2.405	41.713	46.722	27.444	6.216	12.150
Glutineux — Glutinous	100	8.851	2.213	43.084	45.850	20.959	2.482	20.742
Saitama								
Commun — Common .	100	9.293	3.097	43.178	44.427	26.340	5.393	8.003
Glutineux — Glutinous	100	8 528	2.904	44.478	44.092	19.104	2.425	14.004
Ibaragi								
Commun — Common .	100	9.263	3.087	43.115	44.164	26.190	5.854	7.672
Glutineux — Glutinous	100	8.178	2.516	45.205	43.544	19.355	3.162	13.387
Echigo								
Commun — Common .	100	9.677	2.903	45.597	43.821	26.040	5.569	7.742
Glutineux — Glutinous	100	8.440	2.272	45.165	44.121	19.553	3.004	13.434

It is obvious that in common rice oryzenin there is a predominance of amm arginin and lysin nitrogen, while in the glutinous oryzenin there is an exce monoamino, histidin and cystin nitrogen. The quantities of ammonia nitrog the glutinous rice oryzenin are about 87 per cent of those in the common, a nitrogen 73 per cent, lysin nitrogen about 60 per cent, while monoamino nit in the common is 96 per cent of the glutinous, histidin and cystin nitrogen 60 per cent.

VII. Determination of Tyrosin and Tryptophan.

The method of Fürth and Nobel was used to determine the content of ptophan.

Table VIII.

Percentage of Tryptophan and Tyrosin.

	Akita		Etchu		Asahikawa	
	Commun Common	Glutineux Glutinous	Commun Common	Glutineux Glutinous	Commun Common	Glutineux Glutinous
Tryptophane . . / Tryptophan . . (%)	1.23	1.36	1.05	1.26	1.30	1.16
Tyrosine . . . . / Tyrosin . . . . (%)	0.79	0.83	1.20	1.05	0.92	1.02

VIII. The Formation of Iodoprotein.

The authors prepared iodoprotein by Blum and Straus' method; its iodine tent was determined by Baubigny and Chavanne's method. The results are ılated in Table IX.

Table IX.

Iodine Content of Iodoprotein.

	Akita		Etchu		Asahikawa	
	Commun Common	Glutineux Glutinous	Commun Common	Glutineux Glutinous	Commun Common	Glutineux Glutinous
chantillon . . / ample . . . . (g.)	0.1304	0.1132	0.1264	0.1492	0.1626	0.1085
odure d'argent / ilver iodide. . (g.)	0.0220	0.0199	0.0292	0.0306	0.0316	0.0236
ode — Iodine . (mg.)	11.9463	10.7627	12.6727	12.6750	17.0905	12.7638
ourcentage . . . . / ercentage	9.161	9.507	10.027	10.657	10.511	11.764

From the table it is evident that glutinous rice oryzenin combines with more ıe than that of common rice.

IX. The Determination of Free Amino Nitrogen.

The authors know that the amount of lysin nitrogen in common oryzenin is to in glutinous as 100 to 57. Accepting Van Slyke's and Birchard's suggestion, ıay be considered that the quantity of free amino nitrogen of common rice is ;er than that of glutinous.

Table X.

Free Amino Nitrogen Content of Various Oryzenins.

	Oryzénine du riz commun Common rice oryzenin			Oryzénine du riz glutineux Glutinous rice oryzenin		
	Solution de soude N/5 $\frac{1}{5}$ normal NaOH (c.c.)	Azote Nitrogen (g.)	% d'azote totale % of total N.	Solution de soude N/5 $\frac{1}{5}$ normal NaOH (c.c.)	Azote Nitrogen (g.)	% d'azo totale % of total
Akita	0.55	0.00154	10.50	0.50	0.00140	9.9
Etchu	0.65	0.00182	12.92	0.55	0.00154	11.4
Asahikawa	0.50	0.00140	10.12	0.45	0.00126	9.7
Hyogo	0.61	0.00171	9.07	0.42	0.00117	6.6
Saitama	0.62	0.00175	12.23	0.52	0.00147	11.5
Ibaragi	0.60	0.00168	11.94	0.55	0.00154	11.1
Echigo	0.55	0.00154	11.43	0.50	0.00140	10.4

From the table it is seen that the free amino nitrogen content of common oryzenin is always greater than that of glutinous.

X. The Decomposition of Oryzenin by Pancreatin.

Table XI.

Decomposition of Oryzenin by Pancreatin.

	Nitrogen in 10 c.c. (mg.)		Percentage of total nitrogen	
	Common (Asahikawa)	Glutinous (Shonai)	Common (Asahikawa)	Glutinous (Shonai)
Total nitrogen	12.25	11.75	16.869	16.181
Digestion period (hours)	1.5	20.0	42.0	

Kind of rice	Common	Glutinous	Common	Glutinous	Common	Gluti
Nitrogen of precipitate by Zn-sulphate (mg.) (I)	27.197	24.102	24.203	20.903	18.505	15.
Nitrogen of precipitate by phospho-tungstic acid (mg.) (II) . . .	6.198	10.623	6.541	10.966	9.983	10.

The table shows that glutinous rice oryzenin is decomposed more rapidly t common oryzenin by the action of pancreatin, and also that the polymerisa of the protein molecule is more advanced and complicated in common rice oryz than in glutinous.

XI. The Silver Salt of Oryzenin.

The authors compared the combining power of the two oryzenins with silver.

Table XII.

Combination of Silver with the two Kinds of Oryzenin.

	Oryzénine du riz commun Common rice oryzenin		Oryzénine du riz glutineux Glutinous rice oryzenin	
	Azote contenu dans 0,2 gr. Nitrogen in 0.2 gms. (mg.)	Azote total Total nitrogen %	Azote contenu dans 0,2 gr. Nitrogen in 0.2 gms. (mg.)	Azote total Total nitrogen %
hantillon I . . .	30.389		28.682	
nple I		Moyenne Average 15.2435		Moyenne Average 14.6315
ıantillon II . . .	30.085		29.365	
nple II				

	$AgCl_2$ in 0.4 g. (mg.)	% desséchée % of dried matter	$AgCl_2$ in 0.4 g. (mg.)	% desséchée % of dried matter
ıantillon I . . .	13.40		27.20	
ıple I		Moyenne Average 3.27		Moyenne Average 6.88
antillon II . .	12.80		27.90	
ıple II		Argent Silver 2.47		Argent Silver 5.18
portion de N et e Ag.		16.07		35.48
io of N and Ag Ag /NX100)				

The silver salts of common rice oryzenin contain more nitrogen than those of nous rice, which the salt of glutinous oryzenin contain more silver than those of non rice.

XII. Composition of Acetyl Oryzenin.

For the purpose of studying constitutional differences between the two kinds 'yzenins, the authors acetylated the oryzenins and obtained pyrrole and its atives from the acetyl oryzenin.

The nitrogen fractions are arranged in the following manner:

Nitrogen fraction A.

Ammonia evolved by hydrolysis.

Nitrogen fraction B.

Weak basic nitrogenous substances soluble in ether-amylalcohol.

1. Ether-soluble nitrogen: B1 (pyrrole).
2. Ether-insoluble nitrogen: B2.

Nitrogen fraction C.

Strong base, soluble in ether-amylalcohol.

1. Ether-soluble nitrogen: C1 (pyrrolidin and glyoxalin).
2. Alcohol-soluble nitrogen: C2.
3. Water-soluble nitrogen: C3.

Nitrogen fraction D.

Water-soluble nitrogen.

1. Ether-soluble nitrogen: D1 (pyrrolic acid).
2. Alcohol-soluble nitrogen: D2 (proteol).
3. Potassium carbonate solution soluble nitrogen: D3.

Table XIII.

Percentage of Nitrogen calculated on the Basis of Total Nitrogen as 100.

	Ibaragi		Niigata		Mie	
	Commun Common	Glutineux Glutinous	Commun Common	Glutineux Glutinous	Commun Common	Glutin Glutin
A	10.368	10.037	11.167	11.428	12.263	11.3
B 1 . . .	2.408	1.534	1.736	1.630	1.950	1.2
B 2 . . .	0.736	0.761	0.833	0.376	1.073	0.4
C 1 . . .	0.558	0.681	0.832	1.784	0.957	2.2
C 2 . . .	2.408	3.253	3.000	1.430	2.676	2.7
C 3 . . .	3.913	5.609	3.762	2.118	5.561	8.8
D 1 . . .	3.500	3.064	1.003	0.709	2.296	0.7
D 2 . . .	43.891	46.758	56.667	60.363	44.908	46.3
D 3 . . .	32.218	28.357	21.000	20.361	28.357	25.9

There is a marked difference between the common and the glutinous rice a oryzenin in regard to the production of basic substances, pyrrole, pyrrolidin glyoxalin, pyrrolic acid, proteol and H_2O-K_2CO_3 soluble substance. Common predominates in respect of basic substances, pyrrole, pyrrolic acid and H_2O-K soluble substance; while glutinous exceeds in respect of pyrrolidin and glyox and proteol. The authors believed that glutinous rice oryzenin contained histidin than common. The similarity in structure of histidin and glyoxalin mal easily conceivable that the two compounds are both present in greater quan in the glutinous variety.

11.

PHYSICO-CHEMICAL STUDIES CONCERNING THE SPECIFICITY OF PROTEINS OF DIFFERENT VARIETIES AND SUBVARIETIES OF RICE.

By T. Tadokoro, Y. Nakamura and S. Watanabe.

Introduction.

Almost every study concerning the specificity of particular proteins from ious sources has been made by physiological methods.

Wells and Osborne experimented with pure globulins obtained from the seeds iemp, flax, squash and other plants and found a marked difference between them. ir conclusions have been verified recently by many investigators. Constitutional erences in the proteins derived from different species of plants or animals have n shown to be due to a varying distribution of those amino acids which are sidered essential for maintaining adequate nutrition. These experiments were ried out with proteins from species of plants or animals which differed so much n one another that one would expect to find considerable differences in their mical constitutions. The authors determined to investigate the specificity of erent varieties of pure oryzenins all prepared from rice. They carried out expe- ents with many varieties of rice, and established the existence of a physico- mical specificity among them.

Among many hundreds of varieties of common rice, two types are distinguished apan, those employed for the fermentation of Sake and those not so employed. example, in Settsu, Yamadaho ("Banshu-Ao") is used for fermentation but Shinriki ("Banshu-Aka"); in Tajima, Kokuryomiyako is selected but not oshu; in Akita, Kamenoo but not Toyokuni; in Etchu, Mayezawa but not Oba; Echigo, Bantakamiya and Yonemitsu but not Ishijiro. That these particular eties selected for fermentation must have some specific qualities is not hard to ecture. The present investigation was undertaken to elucidate this point.

A. Materials.

Table I.

	District	Variety name	Commercial grade		
No. 1	Bizen.	Aka	Unhulled	3	Unfermentab
No. 2	Harima, Kasai.	Yamadaho	»	»	Fermentable
No. 3	» Katsushika	Shinriki	»	»	Unfermentab
No. 4	Tajima.	Kokuryomiyako	Hulled	»	Fermentable
No. 5	»	Mino	»	»	Unfermentab
No. 6	Ugo, Yokote.	Toyokuni	Unhulled	»	»
No. 7	» »	Kamenoo	»	»	Fermentable
No. 8	Etchu.	Oba	»	»	Unfermentab
No. 9	»	Mayezawa	»	»	Fermentable
No. 10	Echigo.	Ishijiro	»	»	Unfermentab
No. 11	»	Bantakamiya	»	»	Fermentable
No. 12	»	Yonemitsu	»	»	»

B. Mineral Content of Oryzenins.

Table II.

	Eau Water	Cendre Ash	Soufre Sulphur	Phosphore Phosphoru
		%	%	%
No. 1	8.6300	0.3500	0.9586	0.1087
No. 2	10.0701	0.2660	0.8284	0.1050
No. 3	8.1906	0.3050	1.0400	0.1266
No. 4	9.3190	0.3970	0.8120	0.1189
No. 5	9.1790	0.4180	1.0905	0.1274
No. 6	2.7550	0.5750	0.7039	0.1108
No. 7	2.7830	0.4520	0.6419	0.1069
No. 8	8.6707	—	—	—
No. 9	8.4279	0.2402	1.0418	0.1154
No. 10	9.0164	0.2638	0.9702	0.1423
No. 11	6.5041	0.2354	0.9647	0.1222
No. 12	6.3953	0.2350	0.9665	0.1240

From the table it is seen that the ash content of oryzenin from fermentab rice is always less than that of unfermentable from the same district.

The oryzenin of unfermentable rice seems to contain more sulphur and phosphorus an that of fermentable, but the difference is not great.

C. The Rotatory Degree of Oryzenin Alkali Solutions.

Table III.

	No. 2	No. 3	No. 4	No. 5	No. 8	No. 9	No. 10	No. 11	No. 12
ıtzke egree	–3.50	–4.00	–3.40	–3.90	–3.80	–2.60	–1.60	–1.30	–1.40
rotatory egree	–67.28	–75.61	–64.88	–74.41	–88.30	67.47–	–83.04	–67.47	–72.66

Mean of unfermentable –80.35

Mean of fermentable –67.95

The specific rotation of fermentable rice oryzenins is considerably less than that unfermentable rice oryzenins; the value of the former is between 64.88 and 66 (mean 67.95), while that of the latter is between 74.41 and 88.30 (mean 80.35).

D.

It was observed that oryzenin from fermentable rices showed a maximum face tension and turbidity with a smaller amount of HCl solution than that from ermentable rices. The iso-electric point of the oryzenin of the fermentable is therefore more acidic than that of the unfermentable.

E. The Silver Salts of Oryzenins.

Table IV.

Nitrogen and Silver Content of Silver Salts of Oryzenins.

	No. 1	No. 2	No. 3	No. 4	No. 5	No. 10	No. 11	No. 12
ɔgen	16.525	15.836	14.684	15.492	13.771	16.771	11.705	15.836
r	4.2906	5.1939	3.9143	5.0434	2.9357	5.6456	5.3258	5.7961
100	25.9	32.7	26.6	32.5	21.3	32.6	45.5	36.6

Ozyzenin from fermentable rice combines with larger quantities of silver than from unfermentable, showing the predominance of carboxyl groups in the cule of the former as compared with the latter.

F. The Kinds and Quantities of Amino Acids found in Oryzenins.

Table V.

Percentages of Nitrogen formed when oryzenins were hydrolised by Hcl.

	Azote total Total N	Azote contenu dans						
		Ammoniaque Ammonia N	Mélanine Melanin N	Acides monoaminés Mono-amino N	Acides diaminés Diamino N	Arginine Arginin N	Histidine Histidin N	Lysine Lysin N
No. 1	100	9.5889	2.2084	56.1779	32.0308	19.6329	4.7995	6.4468
No. 2	100	8.6188	1.8866	56.8933	32.3477	18.8580	6.1200	5.0041
No. 3	100	9.2484	2.0228	55.7996	32.9292	20.8031	5.8078	5.1660
No. 4	100	8.6931	1.8716	56.7022	32.7276	18.6785	8.1422	4.0294
No. 5	100	8.7394	2.0731	55.8971	33.3228	19.6092	7.4916	6.9426
No. 6	100	9.7302	2.6234	49.9189	35.9683	23.3919	6.9426	4.4408
No. 7	100	9.4555	2.3444	51.2554	36.3588	23.3507	8.3000	3.3692
No. 8	100	10.2008	2.1136	58.8211	28.8046	17.3897	7.6029	2.7201
No. 10	100	10.7730	2.3942	54.9718	31.9201	21.9545	5.4745	3.4772
No. 11	100	10.7310	2.4792	56.8255	29.9643	18.6432	7.5587	2.5676
No. 12	100	10.4168	2.0832	58.4885	29.0414	17.9995	7.5521	2.5710

There is a definite difference in the proportions of amino acids obtained oryzenins of the two types of rice; fermentable rice oryzenin is relatively def in respect of ammonia, melanin and lysin nitrogen and predominates in re of histidin and cystin nitrogen.

G. Free Amino Nitrogen of Oryzenins.

Table VI.

	Free amino nitrogen as percentage of total nitrogen
No. 1	11.7313
No. 2	10.2456
No. 3	10.5826
No. 4	9.8583
No. 5	10.4402
No. 6	9.6763
No. 7	9.0775
No. 8	12.7630
No. 9	11.5360
No. 10	17.6052
No. 11	15.2633
No. 12	14.3813

The free amino nitrogen of fermentable rice oryzenin is less than that of u mentable. This explains why the latter is more basic than the former.

DIFFERENCES
TWEEN SOME PHYSICO-CHEMICAL PROPERTIES OF COMMON AND GLUTINOUS RICE STARCH.

By Tetsutaro Tadokoro and Collaborators.

Introduction.

It is well known that granules of starches vary in their appearance and properties rding to their origin; for instance, sago, tapioca and cassava starches yield glutinous sol than others. We find similar differences between common and nous rice starches.

It is well known that there are two different kinds of rice starch, common glutinous. The difference between the two kinds of starch is shown by the e colour reaction, in which common rice starch gives a blue colour while the nous rice starch gives a red or purple colour. To explain this phenomenon, ka concluded that the red colouration of the latter is due to a characteristic ical property of the starch itself and denied Dafert and Mayer's theory of amination with amylopectin, erythrodextrine or special albuminoids. Concerning differences between common and glutinous starches, no investigation can ound. The following investigation was carried out to determine any such rences.

SAMPLES OF STARCH AND THEIR MINERAL CONSTITUENTS.

The materials used for the preparation of the starches were unhulled and d rice produced in different parts of Japan in the years 1921 to 1924. The nous rice was found mixed with 0.15–2.0 per cent of common rice, which was ved. The preparation of the starches was carried out mainly according to 's method. The starches obtained were white and their water suspension paste were neutral to litmus paper and phenolphthalein. The content of water of ash were determined with the following results.

Table I.

	Amidon de					Amidon de			
	Riz commun Common rice starch		Riz glutineux Glutinous rice starch			Riz commun Common rice starch		Riz glutineux Glutinous rice starch	
	Eau Water	Cendre Ash	Eau Water	Cendre Ash		Eau Water	Cendre Ash	Eau Water	Cendre Ash
ba . .	3.93	0.10	8.38	0.12	Mie . . .	8.57	0.16	8.92	0.10
subetsu	10.98	0.18	11.11	0.13	Akita . .	13.38	0.11	12.24	0.08
ita . .	10.56	0.12	10.44	0.10	Asahikawa	11.80	0.15	11.74	0.13
ogo .	7.62	0.13	8.21	0.06	Ibaragi .	7.81	0.10	8.01	0.04
chigi .	10.41	0.09	11.02	0.05	Mino . .	11.06	0.20	10.50	0.15
ga . .	7.66	0.12	8.05	0.10	Moyenne Average		0.13	—	0.09

Common Rice Starch, free from Glutinous Starch.

	Higo	Hiuga	Shikoku	Shonai	Kumamoto	Chiba	Siam	Formosa	Mar
Water . .	9.60	8.94	7.80	10.20	7.50	8.93	9.58	7.28	7.
Ash . . .	0.06	0.09	0.08	0.10	0.06	0.04	0.09	0.09	0.

From the above results the authors deduce that the ash content of glut rice starch is always less than that of common rice starch.

The mineral constituents of starch are K_2O, P_2O_5, CaO and SiO_2; Samec s that 100 grams of starch ash contain 19.4 g. of SiO_2 and 46.6 g. of which are abundant in amylopectine and are very scarce in amylose. The am of these constituents in different kinds of rice starch was determined.

Table II.

Common Rice Starch: Percentages of Total Ash.

	P_2O_5	SiO_2		P_2O_5	SiO_2		P_2O_5	Si
Atsubetsu	13.85	4.24	Akita . .	3.34	29.72	Mie . . .	8.01	5
Hyogo . .	8.56	8.82	Asahikawa	6.70	9.21	Kamenoo	22.47	11
Higo . .	7.35		Saitama .	6.60	29.52	Etchu . .	4.63	11
Saitama .	—	29.01	Kiushu .	—	19.15	Ibaragi .	5.15	17
Tochigi .	—	8.22	Higo . .	5.47	21.66	Niigata .	4.13	58

Glutinous Rice Starch: Percentages of Total Ash.

	P_2O_5	SiO_2		P_2O_5	SiO_2		P_2O_5	Si
Atsubetsu	16.71	19.67	Kiushu .	1.14	17.61	Shinohara	2.10	51.
	4.36	—	Mie . . .	5.78	29.51	Ibaragi .	7.57	77.
Etchu . .	3.21	14.48						

Average of Percentages of P_2O_5 and SiO_2.

	Common rice starch	Glutinous rice starch
P_2O_5	9.26	7.76
SiO_2	18.13	35.79

The average amount of P_2O_5 is greater in common rice starch than in gluti and the amount of SiO_2 is less. The quantities of the two constituents were present in any fixed proportions, so that it was supposed that they made no def compound with the $C_6H_5O_{10}$-radicle in starch.

SOME PHYSICO-CHEMICAL PROPERTIES OF STARCH GRANULES.

1. Swelling of Starch Granules.

In the following experiments the authors took 2 g. of air-dried starch prepared ne above method and mixed it with 25 c.c. of solutions of iodine in potassium e of different concentrations, such as N/10, N/25, N/50, N/100, N/150; no eable difference could be discovered in the degree of swelling.

Table III.

ncentration de la solution I-KI oncentration of I-KI solution	Grains d'amidon de riz commun Common starch granules		Grains d'amidon de riz glutineux Glutinous starch granules	
	Volume observé Observed volume	% de l'augmentation de volume % of increased volume	Volume observé Observed volume	% de l'augmentation de volume % of increased volume
N/10	3.67 c.c.	217	13.66 c.c.	592
N/12	3.45 »	204	12.11 »	535
N/13	—	—	11.75 »	519
N/14	3.08 »	182	10.65 »	470
N/15	2.68 »	164	9.92 »	438
N/20	2.43 »	144	9.17 »	405
N/25	2.15 »	127	4.80 »	181
N/40	2.13 »	126	3.03 »	133
N/50	2.13 »	125	2.54 »	112
N/100	2.11 »	125	2.27 »	104
N/150	1.81 »	110	2.26 »	100
au (témoin) ater (control)	1.69 »	100	2.26 »	100

2. Absorption of Iodine by Starch Granules.

gram of water-free starch was taken in each bottle and to it were added . of iodine water or alcoholic solution of iodine of various concentrations, such 200, N/150, N/100, N/75, N/50, N/25, N/15, N/14, N/13, N/12, N/10. ach bottle was shaken in the shaking apparatus for 30 minutes when the otion of iodine solution by starch had attained its maximum. The solution h bottle was transferred to a glass centrifuge tube as completely as possible and fuged for 15 minutes, when the clear supernatant liquid was separated from the iodide. Five c.c. of the supernatant liquid was titrated with N/10 or N/100 n thiosulphate solution. The results obtained from the above experiments ven in the following table where C = concentration of iodine solution at equili- ; X/M = amount of iodine absorbed by 1 g. starch.

Table IV.

Concentration de la solution d'iode employée pour la réaction / Concentration of I_2 solution used in the reaction	Amidon de riz glutineux Glutinous rice starch				Amidon de riz commun Common rice starch		
	X/M (mg.)	C (mg.)	Log X/M	Log C	X/M	C (mg.)	Log X/M
N/200	19.2813	6.0888	1.285132	0.784526	24.3552	1.0148	1.38659
N/100	36.5328	114.2073	1.562680	1.152500	45.6660	5.0740	1.65969
N/75	45.6660	21.3108	1.659594	1.328580	54.7992	12.1776	1.738780
N/50	71.0360	30.4440	1.851476	1.483500	74.0804	27.3996	1.867000
N/25	169.4716	33.4884	2.229092	1.524894	141.0572	61.9028	2.149406
N/20	202.9600	50.7400	2.307412	1.705350	162.3680	91.3320	2.210509
N/15	228.3300	106.5540	2.358567	2.027550	202.9600	131.9240	2.307412
N/14	228.3300	162.8500	2.358567	2.103290	202.9600	152.2200	2.307412
N/13	243.5520	142.0720	2.386590	2.152500	233.4040	152.2200	2.368100
N/12	243.5520	172.5160	2.386590	2.236840	243.5520	172.5160	2.386990
N/10	262.8332	244.5668	2.419678	2.388406	212.8332	244.5668	2.419678

The logarithms representing the degree of absorption of iodine by glutinou starch do not fall on one straight line according to Freundlich's absorption for but evidently fall along two straight lines which have a markedly different dir from each other.

In the case of common rice starch, though the logarithms seemed to fall a on one straight line, yet, as in the case of glutinous rice starch, the authors found they fell along two straight lines which had only a slightly different direction each other. When the authors used an alcoholic solution of iodine instead watery solution, they could plot one straight line, expressing the logarithmic equ of Freundlich's formula, in the case of both kinds of starch.

Constants obtained from the straight lines expressing logarithms of absor are as follows:

Table V.

Constants	Glutinous rice starch		Common rice starch	
log K . . .	2.03	0.69	1.20	1.3
1/n	11.0/68.5=0.1605	20/26.5=0.7547	27/50.5=0.5347	23/68

The constants obtained by calculation are as follows:

Table VI.

Glutinous rice starch.

(α) Taking two values for log X/M and log C,

$2.419678 = \log K + 1/n 2.388406$

$2.307412 = \log K + 1/n 1.705350$

$0.112266 = 1/n 0.683056$

$1/n = 0.1643$

$2.419678 = \log K + 0.1643 \times 2.388406$

$K = 106.478$

Common rice starch.

(α) Taking two values for log X/M and log C,

$2.386590 = \log K + 1/n 2.2$

$2.149406 = \log K + 1/n 1.7$

$0.237184 = 1/n 0.4$

$1/n = 0.5528$

$2.386590 = \log K + 0.5528 \times 2.2$

$K = 15.66$

king two values for log X/M and
g C,

.562680 = log K + 1/n1.152500
.285132 = log K + 1/n0.784526

.277548 = 1/n0.367974

1/n = 0.7543

32 = log K+0.9543 × 0.784526
K = 493577

(β) Taking two values for log X/M and log C,

1.869700 = log K + 1/n1.437750
1.386590 = log K + 1/n0.006384

0.483110 = 1/n1.431366

1/n = 0.34

1.869700 = log K + 0.34×1.437750
K = 24.04

ext, the authors examined the absorption by starch of iodine in watery
on, using different samples; they calculated the constants by the method of
quares to be described later.

Table VII.

Chiba		Mie		Atsubetsu	
Common	Glutinous	Common	Glutinous	Common	Glutinous
0.4406	0.7907	0.4621	0.7452	0.5460	0.7936
19.0521	4.7211	25.4965	6.01413	11.3900	4.3936

ie results are very similar to those of the first experiment, *i.e.*, K for common
arch is greater than that for glutinous; with respect to 1/n the reverse was
ed. The following experiments were made with alcoholic iodine solution
l of watery solution.

Table VIII.

Akita		Etchu		Asahikawa	
Common	Glutinous	Common	Glutinous	Common	Glutinous
0.5412	0.6666	0.5425	0.6644	0.5344	0.6124
0.9192	0.7452	0.8307	0.6863	0.7524	0.7524

ie value of K for common rice starch is greater than that for glutinous, while
r the former is less than that for the latter.

3. The Resistance of Starches against Sulphuric Acid.

In order to examine the resistance of glutinous and common rice star against sulphuric acid, the following experiment was carried out. Two g. of st were introduced into a bottle and mixed thoroughly with 50 c.c. of water; sulph acid of various concentrations (such as 1 c.c. of 1/100 H_2SO_4, 1/10 conc. H_2 etc.) was added and the mixture was boiled on a water-bath with a long glass as a condenser for 2–4 hours. The solution was filtered after the digestion complete and the remaining precipitate was washed with water till the filt gave no acid reaction. The precipitate and the filter paper were then introd into a drying tube and dried in a water oven till a constant weight was obtai The results are shown in the following table.

Table IX.

	Residue in % of air-dried substance			
	Rice Starch			
	Glutinous	Common	Glutinous	Comm
2 g. Starch + 50 c.c. H_2O+1 c.c. H_2SO_4 (1/100 conc.) boiled for 2 hours . . .	0.7250	0.4600	0.8259	10.6
2 g. Starch + 50 c.c. H_2O+1 c.c. conc. H_2SO_4 boiled for 2 hours	0.3250	0.7050	0.3702	07.
2 g. Starch + 50 c.c. H_2O+1 c.c. conc. H_2SO_4 boiled for 4 hours	0.1950	0.4350	0.2221	0.4
2 g. Starch + 50 c.c. H_2O+1 c.c. conc. H_2SO_4 boiled for 6 hours	0.1950	0.4350	0.2221	0.4
2 g. Starch + 50 c.c. H_2O+1 c.c. conc. H_2SO_4 boiled for 4 hours	0.1850	0.4300	0.2107	0.4
2 g. Starch + 50 c.c. H_2O+1 c.c. H_2SO_4 (1/100 conc.) boiled for 2 hours . . .	0.1950	11.3000	0.2178	12.8
2 g. Starch + 50 c.c. H_2O+1 c.c. H_2SO_4 (1/10) boiled for 2 hours	0.1500	1.0350	0.1615	1.1
2 g. Starch + 50 c.c. H_2O+5 c.c. H_2SO_4 (1/10) boiled for 2 hours	0.1200	0.7950	0.1340	0.9
2 g. Starch + 50 c.c. H_2O+ 1 c.c. conc. H_2SO_4 boiled for 2 hours	0.0100	0.6000	0.0782	0.6

Further experiments were undertaken with different samples. One gra water-free starch was introduced into a bottle and mixed thoroughly with 5 of water to which was added 1 c.c. of concentrated sulphuric acid; it was then h on the water-bath (98–100°C.) with a long glass tube as a condenser for 2 h The solution was filtered after digestion; the remaining precipitate was wa with water till the filtrate gave no acid reaction. The dried precipitate was wei

he filtrate neutralised and made up to 100 c.c. The reducing power of a definite ity of the solution was determined by Bertrand's method. The results obtained iven in the table.

Table X.

	Akita		Etchu		Asahigawa	
	Common rice	Glutinous starch	Common rice	Glutinous starch	Common rice	Glutinous starch
luble residue (mg.)	4.05	1.25	4.30	2.40	6.15	3.80
luble residue (% of arch)	0.405	0.125	0.430	0.240	0.615	0.380
io	100	30.8	100	55.8	100	61.7
in 20 c.c. solution ng.)	353.113	349.059	356.631	350.274	362.249	358.341
ose, calculated	186.069	183.735	187.738	184.316	191.249	189.071
erence between glu- se content of com- on and glutinous	2.333		3.422		2.178	
ar (% of starch)	93.03	91.87	93.86	92.15	95.62	94.53
erence between com- on and glutinous	1.16		1.71		1.19	

rom the results shown in Tables IX and X, the following conclusions were : (1) after hydrolysis with sulphuric acid common rice starch leaves a greater ble residue than glutinous; (2) the hydrolytic products of common rice starch in a greater quantity of reducing sugar than those of the glutinous variety.

4. Charcoals from Starch Granules.

he authors investigated the difference between the charcoals obtained from on and glutinous rice starches. The difference in the power of adsorbing iodine bserved in the case of charcoals obtained from common and glutinous rice es. The value of the constant K in the case of common rice starch charcoal reater than that of glutinous, while 1/n of the former was less than that of tter. The relation of the constants is just the same as that of the adsorption ine by starch granules. The experiment was repeated with different samples he results obtained are here given as well as calculations of the adsorption nts.

Table XI.

Concentration de la solution de iode / Concentration of I_2 solution	Charbon d'amidon de riz commun / Common rice starch charcoal				Charbon d'amidon de riz glutineux / Glutinous rice starch charcoal			
	C (mg.)	X/M (mg.)	log C	log X/M	C (mg.)	X/M (mg.)	log C	log X
	1.5816	14.2785	0.20045	1.15470	3.4903	12.3747	0.54287	1.09
N/100	7.6152	24.1148	0.88168	1.38229	12.3747	19.3553	1.09255	1.28
N/75	13.9612	28.3667	1.14492	1.45282	17.2929	25.0037	1.23786	1.39
N/50	32.0473	31.4127	1.50579	1.49711	32.6819	30.3781	1.51430	1.48
N/25	87.5748	39.3452	1.94238	1.59489	85.9883	40.6144	1.93440	1.60
N/15	163.7268	47.5950	2.21412	1.67757	159.9192	49.4988	2.20390	1.69
N/10	266.8493	50.4504	2.42627	1.70286	261.4552	55.8448	2.41740	1.74
Equations des observations / Observation equations	$\log k+1/n(0.20044)-1.15470=0$				$\log k+1/n(0.54283)-1.09255=$			
	$\log k+1/n(0.88168)-1.38229=0$				$\log k+1/n(1.09255)-1.28680=$			
	$\log k+1/n(1.14492)-1.45282=0$				$\log k+1/n(1.23786)-1.39800=$			
	$\log k+1/n(1.50579)-1.49711=0$				$\log k+1/n(1.51430)-1.48824=$			
	$\log k+1/n(1.94238)-1.59489=0$				$\log k+1/n(1.93444)-1.60868=$			
	$\log k+1/n(2.21412)-1.67757=0$				$\log k+1/n(2.20390)-1.69460=$			
	$\log k+1/n(2.42627)-1.70286=0$				$\log k+1/n(2.41740)-1.74698=$			
	$7\log k+1/n(10.31560)-10.46224=0$				$7\log+1/n(10.94332)-10.31685=$			
Equations normales / Normal equations	$10.31560\log K+1/n(18.95774)-16.31117=0$				$10.94332\log K+1/n(19.75484)-17.04134$			

$1/n = 0.1999$ $1/n = 0.3448$

	Common rice starch charcoal		Glutinous rice starch charco	
	1/n	K	1/n	K
Chiba	0.283	11.9039	0.3095	10.4429
Mie	0.1999	15.4848	0.3448	8.6060
Asahikawa	0.2560	11.6271	0.3108	9.4338

5. Methylation of Starch.

The authors determined the methoxyl group in methyl starch by Zeisel's
cess as modified by Hewitt and Moore; they found a definite difference bet
the methoxyl content of glutinous and common rice methyl starches.

Table XII.

of starch	Akita		Etchu		Asahigawa	
	Common	Glutinous	Common	Glutinous	Common	Glutinous
. . . . .	2.429	0.832	1.568	0.564	1.277	0.430
. . . . .	2.464	0.837	1.554	0.561	1.305	0.438
rage. . .	2.446	0.834	1.561	0.562	1.291	0.434
io	100	34.2	100	36.0	100	53.6

The methoxyl group content of glutinous rice starch is less than that of common; alue of the former is 34 to 36 per cent of the value of the latter.

6. Acetylation of Starch.

The method of acetylation of cellulose and starch has been reported by many rs, such as Boeseken, Randall, Meyer and Lassar-Cohn; acetic anhydride and were used in these experiments.

Content of Acetyl Group in Acetyl starch.

The acetyl group of acetyl starch was determined by Wenzel's method; the ing results were obtained.

Table XIII.

	Akita	Etchu	Hyogo	Chiba	Asahikawa
	Com. Gluti.	Com. Gluti.	Com. Gluti.	Com. Gluti.	Com. Gluti.
starch . . .	58.46 57.47	56.98 54.44	57.97 57.08	57.77 55.99	54.50 53 71
o.	100 : 98.30	100 : 95.89	100 : 98.46	100 : 96.91	100 : 98.91

he acetyl group content of common rice acetyl starch is always greater than that tinous rice acetylstarch. This is due to the greater number of OH groups in mer.

Melting-point and Specific Rotatory Power of Acetyl starch.

he melting-points of the acetyl starches were determined by the ordinary d with the following results.

Table XIV.

	Com.	Gluti.	Com.	Gluti.	Com.	Gluti.	Com.	Gluti.	Com.	Gluti.
g-point	157–8	149	164	148–150	158–9	151	158–160	150–2	159–160	149

The melting-point of common rice acetyl starch is always higher than th glutinous.

The specific rotatory power of acetyl starch dissolved in pyridin was determ by Haensch-Schmidt's half-shadow polariscope.

Table XV.

	Acétyl-amidon de riz commun Common rice acetyl starch	Acétyl-amidon de riz glutineu Glutinous rice acetyl starch
Akita . .	$[\alpha]_D^{15} = \frac{-7.1 \times 0.346 \times 25}{0.2 \times 2} = +156.04$	$[\alpha]_D^{15} = \frac{-6.9 \times 0.346 \times 25}{0.2 \times 2} =$
Etchu . .	$[\alpha]_D^{15} = \frac{-7.05 \times 0.346 \times 25}{0.2 \times 2} = +152.46$	$[\alpha]_D^{15} = \frac{-6.7 \times 0.346 \times 25}{0.2 \times 2} =$
Asahikawa	$[\alpha]_D^{15} = \frac{-6.8 \times 0.346 \times 25}{0.2 \times 2} = +147.05$	$[\alpha]_D^{15} = \frac{-5.8 \times 0.346 \times 25}{0.2 \times 2} =$
Hyogo . .	$[\alpha]_D^{15} = \frac{-7.0 \times 0.346 \times 25}{0.2 \times 2} = +151.37$	$[\alpha]_D^{15} = \frac{-6.6 \times 0.346 \times 25}{0.2 \times 2} =$
Chiba . .	$[\alpha]_D^{15} = \frac{-3.6 \times 0.346 \times 25}{0.1 \times 2} = +160.89$	$[\alpha]_D^{15} = \frac{-6.5 \times 0.346 \times 25}{0.2 \times 2} =$

7. Heat of Combustion of Starch.

The heat of combustion of starch averages 4.18 calories, but it is not pre the same in all kinds of starch. The heat of combustion of pure common and nous starches was determined by means of Atwater and Benedict's bomb-calorir with the following results.

Table XVI.

	Etchu		Akita		Chiba	
	Common	Glutinous	Common	Glutinous	Common	Glutinous
Calories per 1 g.	4117.8	4033.0	4109.3	4033.3	4018.3	3998.4
	Hyogo		Asahikawa		Atsubetsu	
	Common	Glutinous	Common	Glutinous	Common	Glutinous
Calories per 1 g.	4064.1	4059.7	4199.0	4033.4		3893.3

The heat of combustion of common rice starch is greater than that of gluti

III. STARCH SOLUTION AND IODINE.

A great deal of discussion has taken place concerning the nature of the rea between starch and iodine.

Explanations have been sought on the lines of the theory of colloidal solu but it is outside the scope of the present work to discuss this theory. The au have made a study of other work concerned with the differences between con

glutinous rice starch. As is well known, glutinous rice starch gives a red colour
iodine, whereas common rice starch gives a blue colour. The colour reaction
lutinous rice starch has been investigated by Tanaka, who has denied Dafert's
hrodextrine theory, Atkinson's albuminoid theory and Shimoyama's amylo-
rine theory and concluded that the red colour reaction of glutinous rice starch
iodine is a characteristic property of the starch granule itself. He gave no
anation of this characteristic property, therefore the following experiments were
rtaken to throw further light on it.

1. Colour Reaction of Pseudo-solution of Starch with Iodine.

The colour of a pseudo-solution of starch with iodine varies according to the
of the absorbed to the remaining quantity of iodine. The following experiments
undertaken to show how this colour may be changed by altering the concentra-
of iodine in the starch solution. The authors took 5 c.c. of starch solution of
rent concentrations and added different quantities of a solution of iodine in
ssium iodide. (The iodine solution was prepared by mixing 2 g. of iodine, 6 g.
otassium iodide and 100 c.c. of water.) Each mixture was then diluted to the
volume and the resulting colours were observed. In the following table, "D"
esses the original concentration of iodine solution.

Table XVII.

ne solution c.c.	Common rice starch solution			
	0.05%	0.1%	0.2%	0.5%
.1 D/4	blue	blue	blue	blue
.1 D/2	brownish-blue	blue	blue	blue
.5 D/2	brown	bluish-green	blue	blue
.0 D/2	greenish-brown	brownish-green	blue	blue
.0 D	reddish-brown	greenish-brown	brownish-green	greenish-blue
	Glutinous rice starch solution			
	0.05%	0.1%	0.2%	0.5%
1 D/4	reddish-purple	violet-purple	light purple	pink
1 D/2	brown	purple	purple	purple
5 D/2	brown	reddish-brown	brownish-purple	reddish-purple
0 D/2	brown	brown	reddish-brown	purple
0 D	—	—	—	—

he same brown or reddish-brown colour was observed in the two kinds of
solution, though it did not appear with the same concentration of iodine. In
lutinous rice starch solution, the reddish-brown colour appeared more readily

with dilute solutions of iodine than in the case of common rice starch. This may due to the fact that in glutinous rice starch solutions the quantity of iodine remain unabsorbed was greater than in the case of common rice starch.

Next, the authors set out to examine the iodine-starch colour reaction w the starch content was in excess of the iodine content. For each of these experim the authors took 5 c.c. of a 0.5% starch solution and added to each the follow different small quantities of iodine solution.

Table XVIII.

No. of experiment	Concentration of iodine solution	c.c. of iodine solution added	Colour of common rice starch solution	Colour of glutin rice starch solu
1	N/4000	0.4	no colour	no colour
2	N/4000	0.3	light purple	no colour
3	N/4000	1.5	deep blue	light blue
4	N/2000	1.0	deep blue	light blue
5	N/2000	2.0	deep blue	purple
6	N/2000	3.0	deep blue	red

Almost the same blue colour was observed in both common and glutinous starch solutions. With glutinous rice starch the blue colour appeared when the io content was in excess of the starch content, and with common rice starch the red brown colour appeared when the starch content was in excess of the iodine con

The intensity of the above colours in the two starch solutions was comp by means of Dubosque's colourimeter.

Table XIX.

No. of above experiment	Colour of solution	Thickness of common rice starch solution (mm.)	Thickness of glutinous rice starch solution (mm.)	% of colou intensity
3	blue	3.6	12.4	29.03
4	blue	2.0	11.1	18.01
7	purple	11.0	7.0	63.63

In experiment No. 7, different quantities of iodine solution were added t two starch solutions, *i.e.*, 0.8 c.c. to common rice starch solution and 4.6 c glutinous rice starch solution. This was because the purple colour of glutinou starch solution was more intense than that of common rice starch solution, t the blue colour in experiments Nos. 3 and 4 was more intense in common th glutinous rice starch.

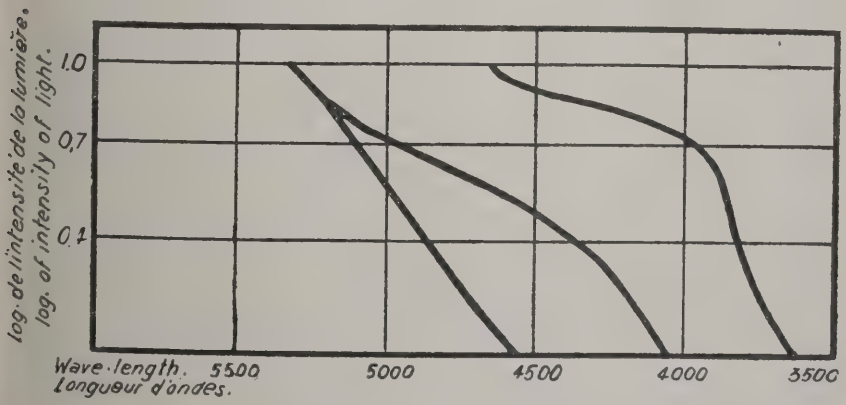
It was necessary to investigate further this colour reaction and the au decided to examine it spectroscopically. First, they examined three iodine-s solutions of different colours — brown, green and blue — to determine the var

ıe position of the absorption bands. They took 5 c.c. of common rice starch tion and mixed with it the following quantities of the iodine-potassium-iodide tion used in the previous investigations. A quartz-cell of 10 mm. thickness filled with the solution to be tested; the illuminating source was an electric) of 100 candle-power and the intensity was measured with a photometer. The e-lengths of the boundary lines of the absorption bands were measured on ographic plates, and are given in the following table.

Table XX.

xposure = 60 sec. . . tarch solution . . .)dine solution	brown colour 5 c.c. of 0.05% 1 c.c. of ½ conc.	green colour 5 c.c. of 0.1% 1 c.c. of ½ conc.	blue colour 5 c.c. of 0.1% 1 c.c. of ¼ conc.
Spector of photometer	Wave-length of boundary line	Wave-length of boundary line	Wave-length of boundary line
1.0	4550	4105	3660
0.4	4850	4345	3835
0.7	5100	4990	3965
0.0	5325	5325	4650

The authors traced three curves, plotting the logarithm of intensity of light he ordinate and the wave-length of the boundary lines of the absorption bands he abscissa.



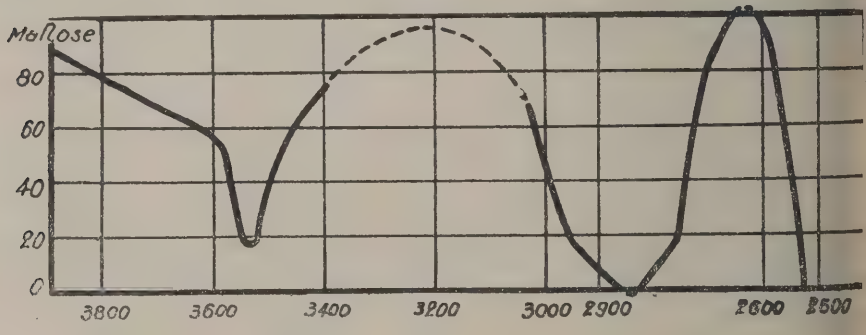
From these three curves it was seen that the absorption of the spectrum of m was greater than that of blue. The next stage was to compare the absorption ıe colour of common and glutinous rice starch in the same concentration of ıe solution. Therefore the authors examined a solution of 10 mm. thickness neans of a quartz-spectroscope (D.I., Adam Hilgard, made in London), using drogen tube of 7 cm. capillary, charging *circa* 15,000 volts A.C. and took photo-hs with six-minute exposures.

Before comparing the colour reactions of the two starches, the authors exam the change in the absorption bands of the spectrum of solutions of different col produced by adding iodine to soluble starch during digestion by Takadiast They took 30 c.c. of soluble starch solution and, after adding 2 c.c. of 1% Takad tase at 45° C., took out samples at different periods and examined them spec scopically; the following results were obtained:

Table XXI.

No.	Minutes of digestion	Colour with iodine solution	Wave length of boundary lines of absorption ban				
			(3700–3300)		(3100–2600)		2600
1	0	blue	—	—	2824	2835	2535
2	20	reddish-violet	3555	3545	2965	2745	2545
3	40	brownish-violet	3555	3525	2975	2745	2555
4	60	reddish-brown	3570	3430	3020	2720	2560
5	80	brown	3610	3395	3050	2700	2560
6	maltose	brown	3810	—	—	2650	2520

The authors traced the following curves, plotting minutes of digestion on ordinate and wave-length on the abscissa.



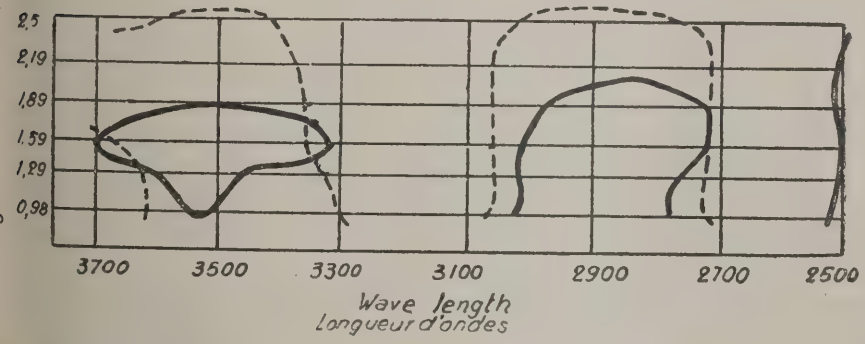
During the dextrination of starch, the spectrum of the solution after the add of iodine showed different types of absorption bands; the first was in the r 3750-3300, the second was in the region 3100-2600, and the third in the region The blue colour caused by the predominance of starch in the solution show greater transparency in the spectrum than the violet or brown colour, which sh a wider absorption band.

Experiments were performed to find out the exact difference betwee absorption bands of mixtures of common and glutinous rice starches with io All photographs were taken with a six-minute exposure through 10 mm. of li illuminated by a hydrogen tube of 7 cm. capillary, charging *circa* 15,000 volts The authors prepared the following starch solutions of different concentra and 30 c.c. of each were mixed with 2 c.c. of 1% iodine solution; the follo results were obtained.

Table XXII

Concentratio of starch solution	Wave-length of boundary lines of absorption bands	
	In common rice starch	In glutinous rice starch
0.0312 %	— — — — 2510	3600-3420 3035-2755 2500
0.0156 %	— — — — 2490	3750-3320 3085-2705 2505
0.0078 %	3520 3000 - 2770 2505	3750-3320 3085-2705 2505
0.0039 %	3725-3330 3085-2775 2507	3680-3340 3070-2705 2710
0.00199 %	3590-3460 3025-2780 2500	3650-3350 3070-2715 2500
0.00097 %	— 3520 3010-2790 2490	3650-3360 3050-2720 2500

he authors traced the following curves plotting the logarithm of concentration rch solution on the ordinate and the wave-length on the abscissa.



ie authors found three different absorption bands in each kind of starch. The as in the region 3800-3200, the second in the region 3000-2700 and the third region 2500. In the case of common rice starch solution, the first and second were not observed with the higher concentrations of starch, while in the case inous they were clearly observed. If this difference between the two kinds ch is considered and compared with the former experimental results, it may cluded that the absorption of iodine by common rice starch is greater than that inous — that is to say, when mixed with iodine the common rice-starch solution is less free iodine than glutinous — starch solution.

2. Decoloration of Iodine-Starch Solutions by X-rays.

ie authors set out to determine the difference between the degree of decoloration 'ays of common and glutinous rice iodine-starch mixtures. They prepared blue solutions with common and glutinous rice starch by the following means. c. of 0.5% starch solution was poured into a glass tube of 12 mm. diameter ixed with 1.5 c.c. of N/4000 iodine potassium iodide solution and exposed

to X-rays from a tube of 5 Benoist units of hardness, consuming 2 milliam alternating current at about 35,000 volts. The light-blue solution of glutinou starch was bleached after an exposure of about ten minutes, while the deep colour of common rice-starch solution still remained; after exposure for 45 mi this colour entirely disappeared.

Next, the authors compared the resistance to X-rays of the colour of i with that of iodine-starch mixture. In this experiment they took 5 c.c. of 0.5% solution, added 1 c.c. of N/600 iodine solution and compared it with iodine so without starch. After 45 minutes exposure the iodine solution was comp bleached, while the iodine-starch solution still retained its colour. It is a very c fact that glutinous rice starch solution changes its colour from red to blue the influence of X-rays, though this blue colour is far lighter than that of co rice-starch solution and fades away, while that of common starch solutio remains. It is apparent that the excess of iodine in glutinous rice-starch solu quickly bleached and the remaining iodine-starch solution shows a blue colo that of common rice starch. The bleaching of the colour of common rice- solution is very difficult because it contains a large quantity of iodine-starch m which is more resistant to X-rays than free iodine.

IV. SOME COLLOIDAL PROPERTIES OF STARCH SOLUTION

1. The Viscosity of Starch Solutions.

Glutinous rice is used in the preparation of "Mochi", a kind of Japanes characterised by its high viscosity. In order to determine whether this vi is due to the high viscosity of the glutinous rice starch employed in its prepa the authors carried out the following experiments with glutinous and c rice starches.

One hundred c.c. of 0.25, 0.5, 0.7 and 1% starch solutions were taken, an viscosities were determined by a MacMichael viscosimeter, at 16.5°C. Fr average values of three samples the authors calculated the following relative sities (water = 1):

Table XXIII.

	Concentration of starch solution			
	0.25 %	0.5 %	0.7 %	1 %
Common rice starch. . . .	2.25	2.50	2.78	2.9
Glutinous rice starch. . . .	2.43	3.78	4.27	10.5

The viscosity of a starch solution differs according to the method by w is prepared. The following samples were prepared by the authors. Starch w into a paste with water by heating it for four minutes on a boiling-water b

aste was then made up to 100 c.c. and boiled for 20 or 40 minutes in boiling at 98 to 100° C. The viscosity of the resulting starch solution was determined by Michael's viscosimeter at 15°C. and the following values for the specific viscosity obtained.

Table XXIV.

	Bouilli pendant 20 minutes Boiled for 20 minutes			Bouilli pendant 40 minutes Boiled for 40 minutes		
Common rice starch	1%	1.5%	2%	1%	1.5%	2%
mmon rice:						
Sai ama	18.5	38.0	91.0	18.5	37.5	98.0
Tochigi.	29.0	78.0	270.0	25.5	75.0	250.0
Higo	21.0	47.5	138.0	20.0	51.0	147.0
Hiuga	24.5	63.5	211.5	25.0	70.0	190.0
Shikoku	26.0	82.5	137.5	26.0	82.0	290.0
Niigata.	23.5	45.5	122.0	22.0	48.0	185.0
Shonai	19.0	37.0	91.0	17.0	43.0	112.0
Chiba	26.5	66.0	201.0	23.0	62.0	192.0
Mie	22.0	52.0	145.5	22.0	56.0	171.0
Hyogo	25.5	61.0	175.0	23.0	62.0	199.0
Ibaragi.	21.0	46.0	135.0	22.0	55.0	131.0

tinous rice h (boiled for minutes).	Etchu	Mie	Hyogo	Atsubetsu	Ibaragi
.5 %	17.0	16.5	16.0	16.5	15.5
.75 %	30.5	31.5	23.0	29.0	35.5
.0 %	56.0	47.0	45.0	44.0	64.0
.25 %	99.0	90.5	81.0	79.5	127.5

The authors observed a remarkable difference between the viscosity of glutinous of common rice-starch solution. The viscosity of the former was always or three times as great as that of the latter, and it varied with the different ies of rice. Further investigation was undertaken to determine the influence the duration of boiling of a starch solution exerted on the viscosity. The ity of starch solutions heated for the following times on a water bath at 100° C. was measured with a MacMichael viscosimeter at 15° C.

Table XXV.

don de riz utineux inous rice starch	Concentration	3 minutes	7 minutes	15 minutes	30 minutes	60 minutes
hu. . .	1.0%	7.1	8.4	8.4	8.3	8.5
ta . . .	1.0%	8.2	8.9	8.9	8.9	8.9
hikawa.	1.0%	6.3	6.2	7.4	7.2	7.5
hu. . .	1.5%	33.4	33.2	39.4	39.8	32.5
ta . . .	1.5%	38.7	39.7	45.7	46.5	44.5
hikawa.	1.5%	24.2	25.9	28.5	20.4	19.2

The viscosity of glutinous rice starch increased proportionally to the l of time of boiling, and reached a maximum at a definite time, after which it decre The length of time of boiling needed to produce the maximum viscosity vari the different kinds of glutinous rice-starch used.

Ten c.c. of 1% or 2% starch solution were introduced into an Ostv viscosimeter and cooled to 20° C. The time (t) required for the outflow of the s solution was noted and compared with that of water (t_0) at 20° C. The rati was used in comparing the viscosity of glutinous and common rice starches the results are given in the following table.

Table XXVI.

Following rice	Glutinous rice starch (1%)	Common rice starch (1%)	Glutinous rice starch (2%)	Common ri starch (2%
t	21 1/5″	14″	25 3/5″	17 3/5″
t_0	8 3/5″	8 3/5″	8 3/5″	8 3/5″
t/t_0	2.465	1.628	1.4605	2.407

The experiment was undertaken with different samples and their s viscosity was calculated.

Table XXVII.

	Chiba		Mie		Atsubetsu	
	Common	Glutinous	Common	Glutinous	Common	Gluti
0.5 %	1.226	1.797	1.065	1.725	1.114	1.5
1.0 %	1.669	4.549	1.602	4.029	1.514	3.3
1.5 %	1.797	18.075	2.239	13.696	1.879	11.4

The viscosity of glutinous rice-starch solution is greater than that of cor rice-starch solution and the difference is more marked with higher concentr of starch in the pastes.

3. Determination of Amylose and Amylopectine in Starches.

The authors determined the difference between the amylose and amylo contents of common and glutinous rice starch respectively. Using Ling and N method they obtained the following results:

Table XXVIII.

	Amylopectin		Amylose	
	Common rice starch	Glutinous rice starch	Common rice starch	Glutinous rice starch
ushu	80.98	28.78	19.02	71.22
ragi	81.09	28.58	18.91	71.47
ubetsu . . .	72.49	20.68	27.68	79.32
. . . . .	72.00	25.49	28.00	74.51

PHYSICO-CHEMICAL PROPERTIES OF SOLUBLE STARCHES.

1. Preparation and Composition of Soluble Starch.

he soluble starch was prepared as follows: 500 g. of starch were soaked in es of 7.5% HCl solution, shaken many times a day and kept for 10 days at The soaked starch was washed with water until the wash water showed orine reaction and it was then washed with 70% alcohol and poured on to cloth placed on a filter. The starch was washed again with pure alcohol ther and dried for two days at 40° C. The amount of water and mineral nces in the sample was determined.

Table XXIX.

	Common rice soluble starch		Glutinous rice soluble starch	
	(1)	(2)	(1)	(2)
sture . . .	7.67	12.87	5.96	11.98
. . . . .	0.038	0.045	0.024	0.028

ie above operation involves a process of demineralisation. There was less l matter is glutinous rice soluble starch than in common soluble starch.

2. Viscosity of Soluble Starch Solutions.

ie viscosity of soluble starch solutions differed greatly from that of the original solutions. The authors determined the viscosity of common and glutinous luble starch solution with Ostwald's viscosimeter at 15° C. Their specific ;y is shown in the following table.

Table XXX.

	Common rice soluble-starch		Glutinous rice soluble star	
	(1)	(2)	(1)	(2)
1.0 %	1.3420	1.3204	1.1316	1.140
1.5 %	1.5296	1.4694	1.2431	1.370
2.0 %	1.6554	1.5712	1.4886	1.518

The viscosity of glutinous rice soluble starch solution was always lowe that of common; it was quite different from that of the original.

3. Alkali Combination with Soluble Starches.

0.5 g. of soluble starch was dissolved in 200 c.c. of 10% NaOH solutio precipitated by the addition of 30 c.c. of 95% alcohol. The supernatant a containing the excess of alkali was poured off and the precipitate was dis in 10 c.c. of water and re-precipitated. The manipulation was repeated seven times and, when the alcohol showed no alkaline reaction, the precipita removed and dried in a sulphuric acid desiccator. The ash content of glu rice alkali soluble starch was less than that of common — 0.37 per cent former and 0.83 per cent in the latter — therefore glutinous rice soluble combined with less alkali than did the common. The glutinous rice alkali starch dissolved easily as a 1% solution, while the common starch formed a sat solution at 0.82 per cent.

4. Precipitation of Alkali Soluble Starch with Alcohol and Acetic

When soluble starch was dissolved in alkali solution, the amount precip with alcohol became steadily less with the lapse of time. Five g. of soluble were mixed with 100 c.c. of 10% NaOH solution and shaken for two hours. different intervals of time a definite quantity of this mixture was mixed wi same volume of 95% alcohol and the precipitate was collected on a filter, dri weighed.

Table XXXI.

	After 2 hours	Difference	After 48 hours	Difference	Af 96 l
Glutinous (%) .	82.09	3.82	78.17	3.82	74
Common (%) .	99.84	4.09	45.75	4.73	91

he alcohol precipitate of glutinous rice alkali soluble starch was less than of common.

When alkali soluble starch was precipitated by the addition of acetic acid, the nt of precipitate varied in the different kinds of soluble starch. 0.5 g. of e starch was dissolved in 5 c.c. of 10% NaOH solution and 20 c.c. of water added; the solution was then neutralised with acetic acid. In the case of on rice soluble starch solution, the precipitate corresponded to 13.87 to 17.44 nt of the original starch, while in glutinous rice soluble starch solution no itate was formed.

13.

BIOCHEMICAL STUDIES OF RICE.

Part I. Oxidase.

By Taro Higuchi

(From the Imperial State Institute for Nutrition Tokyo).

Introduction.

have analysed samples of many varieties of rice from time to time during the wo years, but have found no special changes in their chemical composition due length of time they have been kept. But I have found a great change in their ing power; the activity of the oxidising enzyme (oxidase) gradually diminishes the time the rice is harvested, and during the following year it deteriorates y. It is a well-known fact that there is a distinct difference in the taste of old ew rice, but no one has yet made a quantitative measurement of the relative ty of the ferments.

bout 200 samples of unpolished rice and about 80 samples of polished rice were ed from all over Japan, including Chosen, Formosa, Hokkaido and Manchuria. rices were harvested between the years 1919 and 1923. The samples were in a desiccator over calcium chloride for a few days and then kept in glass s till required; a sample was kept in the desiccator for use in the contrasting ment.

I. Qualitative Experiments with Rice-Oxidases.

hree oxidising ferments were investigated — oxidase, peroxidase and catalase. t the reaction of each, unpolished- and polished-rice flour was extracted and agents were added to the flour. The experiments were performed in April I used " new rice ", harvested in 1922, and " old rice ", harvested in 1921. he results are shown in Table I.

Table I. — The Reactions of Oxidases of Rice.

Reagents	Colour of reaction	Unpol. rice (new)	Unpol. rice (old)	Pol. rice (new)	Pol. (o
10% guaiac tincture . . .	blue	++	+	+	
10% guaiac tincture and hydrogen peroxide . . .	deep blue	++	+	+	
1% guaiacol	red brown	+	—	—	
1% guaiacol, hydrogen peroxide	deep red brown	+++	++	++	
1% hydrogen peroxide . .	oxygen gas	++++	+	+++	
α-naphthol, Na_2CO_3, paraphenylendiamin	blue	++	—	+	
0.05% tyrosin (0.05% Na_2CO_3 sol.)	black	—	—	—	
10% hydroquinone	red brown	+	—	—	
10% hydroquinone, hydrogen peroxide	deep red brown	+++	++	++	
10% pyrogallol	yellow	+	—	—	
10% pyrogallol, hydrogen peroxide.	reddish yellow	++	—	+	
1% paraphenylendiamin .	dark brown	+	—	—	
1% paraphenylendiamin, hydrogen peroxide . . .	blackish violet	++	—	+	
1% α-naphthol (5% alcohol sol.)	lilac	+	—	—	
1% α-naphthol, hydrogen peroxide.	deep lilac	+	—	+	
1% benzidin (50% alcohol sol.)	blue	+	—	—	
1% benzidin, hydrogen peroxide	deep blue	+	—	+	
1% paraphenylendiamin hydroxide	green	+	—	—	
1% paraphenylendiamin hydroxide, hydrogen peroxide	deep green	+	—	+	
2% pyrogallol, 2% paraphenylendiamin	dark brown	+	—	—	
1% guaiacol, 2% paraphenylendiamin	reddish brown	+	—	—	
1 % paraphenylendiamin, guaiacol, hydrogen peroxide	violet	++++	+	+++	

Explanation of Table I.

Oxidase gave a weak reaction.

Peroxidase gave a very strong reaction.

Catalase gave a very strong reaction, that is, large quantities of oxygen were liberated when hydrogen peroxide was mixed with the flour.

Unpolished rice always gave a stronger reaction than polished rice.

New rice always gave a stronger reaction than old rice.

The reactions with paraphenylendiamin, guaiacol and hydrogen peroxide were stronger and more rapid than the other reactions.

New rice has a pleasanter taste and seems to be more nourishing than old rice; act, because most people prefer new rice, its price is always higher than that of rice. Till now there has been no chemical method by which one could distinguish age of rice quickly. Since a coloured oxidation product is formed by the per- ase, this reaction is suitable for testing the age of rice. I have found a rapid od of distinguishing the year in which a sample of rice was harvested.
A method employing guaiacol and hydrogen peroxide was used by Aso. A fication which is simpler and more accurate is as follows:

Method of Distinguishing the Age of Rice (Higuchi's Method).

To about 1 to 2 grams (about 100 rice-grains) of polished or unpolished rice are d the following reagents:

(1) Paraphenylendiamin 1% solution . . . . . 5 cc.
(2) Guaiacol 1% solution . . . . . 10 cc.
(3) Hydrogen peroxide 1% solution . . . . . 0.2 cc.

The outer layer, or silver skin, and the embryo of new unpolished rice, and the al score or longitudinal notch and embryo of new polished rice, become a deep e colour, while these parts in the case of old rice are not coloured.
The reaction occurs in 1 to 3 minutes.
The colour diminishes proportionally to the length of time of preservation of ce and to the grade of polishing.
We can distinguish the grade of polishing by comparing the colour with that of ished rice of the same age.
Table II shows the diminution of the depth of the colour according to the length e of preservation of the rice and to the grade of polishing.

Table II. — The Change of the Deepness of the Colour of Rice by the Reage

Time measured after the harvest		Unpolished rice	Polished ric
One month	November	++++++	+++++
Two months	December	++++++	+++++
Three months	January	++++++	+++++
Four months	February	+++++	++++
Five months	March	+++++	+++
Six months	April	+++++	+++
Seven months	May	++++	++
Eight months	June	++++	+
Nine months	July	+++	—
Ten months.	August	++	—
Eleven months	September	+	—
Twelve months	October	+ or —	—

II. Quantitative Experiments with Rice-Oxidases.

It is important to measure quantitatively the decrease in this oxid reaction. The peroxidase of rice gives the strongest of the oxidase reactions. pyrogallol method can be used to demonstrate it, but it is not a simple me The determination of the activity of the catalase is very simple and accu Therefore, if the catalase and peroxidase reactions run parallel with each o the catalase reaction can be used for the determination of the oxidising power o

Quantitative Method of Determining the Activity of the Peroxidase of Rice

To 10 grams of unpolished-rice flour are added 50 cc. of 2% pyrogallol sol and 10 cc. of 1% hydrogen-peroxide solution. The mixture is kept for 24 hour temperature of 25° C. Pyrogallol is oxidised by the peroxidase to purpurog

$$\underset{\text{pyrogallol}}{C_6H_3(OH)_3} \longrightarrow \underset{\text{purpurogallin}}{OHC_6H_5\begin{matrix}O.OC_6H_3(OH)_2\\O.OC_6H_3(OH)_2\end{matrix}}$$

Quantitative Method of Determining the Activity of the Catalase of Rice (Higuchi's Method).

A suitable method for the quantitative determination of catalase was de after careful investigation into the speed, optimum temperature and time req for the reaction. 500 grains of rice (unpolished or polished) are powdered and 5 of water are added; the mixture is then filtered. To 25 cc. of the filtrate are 10 cc. of 0.5% neutral hydrogen peroxide, and the mixture is kept at 25° C f hour. After that, 50 cc. of sulphuric acid (1: 4) are added and the residual qu of hydrogen peroxide is determined by titration with N /10 potassium permang

ıtion. The percentage of hydrogen peroxide decomposed by the catalase is then ɔulated. The formulæ for the reaction and the calculation are as follows:

$$2KMnO_4 + 5H_2O_2 + 4H_2SO_4 = 2KHSO_4 + 2MnSO_4 + 8H_2O + 5O_2$$

$$1000\text{ cc. } 1/1NKMnO_4 = \frac{H_2O_2}{2} = \frac{34.016}{2} = 17.008\text{ gm. } H_2O_2$$

$$1000\text{ cc. } \frac{N}{10}\ KMnO_4 = 1.7008\text{ gm. } H_2O_2$$

$$1\text{ cc. } \frac{N}{10}\ KMnO_4 = 0.0017008\text{ gm. } H_2O_2 = 1.7008\text{ mg. } H_2O_2$$

$$2.95\text{ cc. } \frac{N}{10}\ KMnO_4 = 0.00501736\text{ gm. } H_2O_2$$

$$= H_2O_2\ 1\text{ cc. } (0.5\%)$$

$$= 5.01736\text{ mg. } H_2O_2$$

Table III shows the comparison of the activities of the peroxidase and the lase of rice by using the methods described above.

Table III. — The Comparison of the Activities of the Peroxidase and Catalase of Rice.

Variété de riz Variety of rice	Localité Locality	Année de la récolte The year harvested	Catalase Décomposition de H^{20^2} en % Decomposed % of H_2O_2	Peroxydase Peroxidase Purprogalline crist. (gr.) Purprogallin crystal (grm.)
ɛage	Hokkaido . . .	1923	75.59	0.3918
inriki	Kumamoto . . .	1923	50.68	0.3472
ıusei-to . . .	Hiroshima . . .	1923	50.17	0.2629
ımeno-o . . .	Akita.	1923	49.66	0.2421
ɡo I.	Fukushima . . .	1923	47.63	0 2163
ıyashinriki . .	Chōsen	1923	43.89	0.2097
kitori	Gumma.	1923	42.37	0.1940
go II. . . .	Fukushima . . .	1922	26.10	0.0650
usei-to . . .	Hiroshima . . .	1922	33.39	0.1423
age	Hokkaido . . .	1922	20.51	0.0224
inriki	Kumamoto . . .	1922	6.61	+
ımeno-o . . .	Akita.	1922	15.25	+
ɛitori	Gumma.	1921	15.09	+
age	Hokkaido . . .	1921	15.95	+
ısei-to . . .	Hiroshima . . .	1921	14.58	+

t was found, as is seen in Table III, that the catalase and peroxidase reactions arallel. Employing the catalase reaction, the whole series of samples were then I. First I determined the amount of catalase in samples sent to me from all

over Japan. The experiments were performed between December and Febru 1924, as the activity of catalase is relatively constant during these months.

Table IV shows the activity of catalase from rices harvested in 1923, Tabl shows that from rices harvested in 1922, Table VI shows that from rices harves in 1921, and Table VII shows that from rices harvested in 1920 and 1919.

Table IV. — The Activity of Catalase of the Rices which were harvested 1

Variétés de riz The varieties of rice	Lieu de production The place of production	Date de l'ense-mencement The time of sowing	Date de la récolte The time of harvest	Sol. $\frac{N}{10}$ de $KMnO_4$ cc. $\frac{N}{10}KMnO_4$ titrated cc.	Décom-position de H_2O_2 en % Decom-posed % of H_2O_2	Poids 1,0 grai de Weigh 1,0 ric grai
Aikoku	Chiba-ken	Avr. 29 April	Oct. 26	6.90	76.61	24
Akage	Hokkaido	Mai 3 May	Sept. 28	7.20	75.59	20.
Yasumura	Saitama-ken	Mai 13 May	Oct. 20	8.00	72.88	22.
Bōzu-gogō	Hokkaido	Mai 14 May	Oct. 3	8.05	72.71	23.
Shinriki	Okayama-ken	Mai 10 May	Nov. 10	8.85	70.00	22.
Kagawashinriki	Kagowa-ken	Avr. 30 April	Nov. 10	9.05	69.32	24.
Ō-mi	Saitama-ken	Mai 13 May	Nov. 1	10.05	64.41	18.
Shinshinriki	Hyogo-ken	Avr. 21 April	Nov. 10.	12.45	57.80	26.
Dōgo-chūto	Elùme-ken	Mai 20 May	Oct. 25	13.30	54.91	25.
Banseishinriki	Kumamoto-ken	Mai 5 May	Oct. 15	13.30	54.91	22.
Banseishinriki	Wakayama-ken	Mai 9 May	Nov. 5	13.80	53.22	24.
Aikoku	Ōsaka-fu	Mai 10 May	Oct. 7	13.95	52.71	22.
Toyokuni	Akita-ken	Avr. 20 April	Sept. 18	14.50	50.85	24.
Shinriki	Kumamoto-ken	Mai 14 May	Oct. 23	14.55	50.68	22.
Chusei-to	Hiroshima-ken	Avr. 30 April	Nov. 5	14.70	50.17	23.
Kameno-o	Akita-ken	Avr. 30 April	Oct. 7	14.85	49.66	23.
Gorobei	Iwate-ken	Avr. 25 April	Sept. 30	15.10	48.82	20
Iwatekameno-o	Iwate-ken	Avr. 26 April	Oct. 14	15.30	48.17	23
Tōgo No. 21	Fukushima-ken	Avr. 21 April	Oct. 4	15.45	47.63	21
Omachi	Ōsaka-fu	Mai 10 May	Oct. 22	15.55	47.29	23
Kameno-o	Yamagata-ken	Avr. 20 April	Sept. 26	15.90	46.10	22
Takasago	Yamanashi-ken	Mai 10 May	Oct. 30	16.00	45.76	22
Kameno-o	Manchuria	Mai 2 May	Oct. 12	16.05	45.59	22

e IV. — The Activity of Catalase of the Rices which were harvested 1923 *(continued).*

Variétés de riz he varieties of rice	Lieu de production The place of production	Date de l'ensemencement The time of sowing	Date de la récolte The time of harvest	Sol. $\frac{N}{10}$ de $KMnO_4$ cc. $\frac{N}{10}KMnO_4$ titrated cc.	Décomposition de H^2O^2 en % Decomposed % of H_2O_2	Poids de 1,000 grains de riz Weight of 1,000 rice-grains
gawashinriki	Kagawa-ken	Avr. 25 April	Nov. 5	16.05	45.59	24.715
Omachi	Kagoshima-ken	Mai 15 May	Oct. 15	16.10	45.42	25.275
ayashinriki	Chŏsen	Mai 1 May	Oct. 20	16.55	43.90	20.206
Ō-ba	Ishikawa-ken	Avr. 18 April	Sept. 13	16.80	43.05	25.218
Ishiziro	Nügata-ken	Avr. 23 April	Oct. 8	16.85	42.88	23.273
Sekitori	Gumma-ken	Mai 10 May	Nov. 3	17.00	42.37	19.348
Tokuryoto	Shimane-ken	Mai 5 May	Oct. 13	17.30	41.36	22.123
Sekitori	Saitama-ken	Mai 13 May	Nov. 1	17.45	40.85	17.819
Senichi	Tochigi-ken	Mai 27 May	Oct. 10	17.50	40.68	18.724
Seki-tori	Kanagawa-ken	Mai 7 May	Oct. 27	18.00	38.98	19.253
inai No. 22	Fukushima-ken	Avr. 21 April	Oct. 18	18.00	38.98	21.054
uoka-Aikoku	Shizuoka-ken	Mai 1 May	Oct. 5	18.05	38.81	23.633
O-machi	Ôita-ken	Mai 2 May	Nov. 2	18.20	38.31	26.885
Toyokuni	Yamagata-ken	Avr. 20 April	Sept. 26	18.25	38.14	23.996
ntoshinriki	Fukuoka-ken	Mai 3 May	Nov. 11	18.70	36.61	24.396
himehari	Chiba-ken	Avr. 29 April	Oct. 29	18 75	36.44	20.938
Omachi	Kagawa-ken	Avr. 25 April	Oct. 5	18.80	36.27	24.575
Ōba	Fukui-ken	Avr. 18 April	Sept. 15	19.00	35.59	23.800
Otoerami	Kŏchi-ken	Mai 15 May	Oct. 15	19.00	35.59	23.809
Sekitori	Chiba-ken	Avr. 29 April	Oct. 17	19.35	34.41	18.583
awashinriki	Kagawa-ken	Avr. 12 April	Nov. 5	19.50	33.90	24.425
iryoshinriki	Fukuoka-ken	Mai 15 May	Nov. 8	20.00	32.20	22.913
Aikoku	Fukushima-ken	Avr. 21 April	Oct. 18	20.25	31.36	24.305
Haziguro	Okinawa-ken	Nov. 20	Juil. 10 July	24.90	15.59	19.990
kyakukara	Formosa	Jan. 29	Juillet 4 July	26.95	8 64	17.496

Table V. — The Activity of Catalase of the Rices which were harvested

Variétés de riz The varieties of rice	Lieu de production The place of production	Date de l'ense-mencement The time of sowing	Date de la récolte The time of harvest	Sol. $\frac{N}{10}$ de $KMnO^4$ cc. $\frac{N}{10}$ $KMnO_4$ titrated cc.	Décom-position de H^2O^2 en % Decom-posed % of H_2O_2	Poid 1.(gra de Weig 1,00(gra
Mubōaikoku	Saitama-ken	Mai 12 May	Oct. 11	12.05	59.15	21.
Bōzu-gogō	Hokkaido	Mai 14 May	Sept. 27	12.15	58.81	23.
Dōgochūtō	Ehime-ken	Mai 20 May	Oct. 20	14.30	51.87	24.
Aikoku	Chiba-ken	Avr. 25 April	Sept. 25	14.60	50.51	22.
Dōgo-Bantō	Ehime-ken	Mai 20 May	Oct. 27	16.25	44.92	25.
Aikoku	Ōsaka-fu	Mai 10 May	Oct. 4	17.70	40.00	21.
Hayashinriki	Chōsen	Mai 1 May	Oct. 15	18.10	38.64	18.
Chusei-to	Hiroshima-ken	Avr. 30 April	Nov. 5	19.65	33.39	23.
Omachi	Ōsaka-fu	Mai 10 May	Oct. 22	19.80	32.88	25.
Shinriki	Mie-ken	Mai 8 May	Nov. 15	20.00	32.20	24.
Otoerami	Kōchi-ken	Mai 15 May	Oct. 15	20.05	32.03	22.
Ishiziro	Nügata-ken	Avr. 24 April	Oct. 7	20.80	29.49	22.
Kairyo-Aikoku	Yamanashi-ken	Juin 10 June	Oct. 28	21.25	27.97	23.
Tōgō	Fukushima-ken	Avr. 24 April	Oct. 20	21.80	26.10	21.
Sekitori	Kanagawa-ken	Mai 7 May	Oct. 24	22.05	25.25	18.
Sekitori	Saitama-ken	Mai 13 May	Oct. 25	22.85	22.54	17.
Toyokuni	Akita-ken	Avr. 20 April	Sept. 18	22.90	22.37	22.
Ō-mi	Saitama-ken	Mai 13 May	Nov 1	23.15	21.53	18.
Sekitori	Chiba-ken	Avr. 25 April	Oct. 15	23.25	21.19	17.
Shimehari	Chiba-ken	Avr. 25 April	Oct. 27	23.30	21.02	19.
Aikoku	Ibaraki-ken	Avr. 25 April	Sept. 28	23.45	20.51	22.
Akage	Hokkaido	Mai 11 May	Oct. 5	23.45	20.51	20.
Sekitori	Gumma-ken	Mai 10 May	Nov. 10	24.00	18.98	18.
Dōgo-wase	Ehime-ken	Mai 20 May	Oct. 7	24.40	17.29	22.
Shinriki	Okayama-ken	Mai 10 May	Nov. 10	24.45	17.12	22.
Kairyo-Shinriki	Fukushima-ken	Avr. 24 April	Oct. 20	24.95	15.42	
Kameno-o	Akita-ken	Avr. 20 April	Sept. 18	25.00	15.25	21.
Hajiguro	Okinawa-ken	Nov. 20	Juil. 10 July	25.35	14.07	21.
Aikoku	Miyagi-ken	Avr. 25 April	Oct. 4	25.35	14.07	23.

V. — The Activity of Catalase of the Rices which were harvested 1922. *(continued).*

Variétés de riz / he varieties of rice	Lieu de production / The place of production	Date de l'ensemencement / The time of sowing	Date de la récolte / The time of harvest	Sol. $\frac{N}{10}$ de $KMnO^4$ cc. $\frac{N}{10}$ $KMnO_4$ titrated cc.	Décomposition de H^2O^2 en % Decomposed % of H_2O_2	Poids de 1.000 grains de riz Weight of 1,000 rice grains
Asahi	Kyoto-fu	Mai 4 May	Oct. 27	26.25	11.02	23.148
Ō-ba	Ishikawa-ken	Avr. 19 April	Sept. 10	27.20	7.80	22.428
Shinriki	Kumamoto-ken	Mai 14 May	Oct. 23	27.55	6.61	22.255
ga-Shinriki	Shiga-ken	Mai 2 May	Nov. 5	27.75	5.32	23.326
kyaku-Kara	Formosa	Jan. 26	Juil. 10 July	27.95	5.25	17.629
okushima-shinriki	Tokushima-ken	Mai 6 May	Oct. 20	28.45	3.56	23.958
Shinriki	Aichi-ken	Mai 3 May	Nov. 9	28.55	3.22	25.621

VI. — The Activity of Catalase of the Rices which were harvested 1921.

Variétés de riz / he varieties of rice	Lieu de production / The place of production	Date de l'ensemencement / The time of sowing	Date de la récolte / The time of harvest	Sol. $\frac{N}{10}$ de $KMnO^4$ cc. $\frac{N}{10}$ $KMnO_4$ titrated cc.	Décomposition de H^2O^2 en % Decomposed % of H_2O_2	Poids de 1.000 grains de riz Weight of 1,000 rice grains
ıyashinriki	Chōsen	Mai 1 May	Oct. 16	24.05	18.48	19.010
Akage	Hokkaido	Mai 9 May	Sept. 29	24.50	16.95	20.807
Sekitori	Gumma-ken	Mai 10 May	Nov. 14	25.05	15.09	19.201
Chusei-to	Hiroshima-ken	Apr. 30 April	Nov. 5	25.20	14.58	25.218
Shinriki	Okayama-ken	Avr 25 April	Oct. 25	25.70	12.88	24.281
hiratama	Nûgata-ken	Avr. 20 April	Oct. 5	26.00	11.86	22.258
uoka-bantŏ	Fukuoka-ken	Mai 14 May	Nov. 3	26.15	11.36	20.728
Otoerami	Kochi-ken	Mai 15 May	Oct. 15	27.10	8.14	20.381
Sekitori	Kanagawa-ken	Mai 5 May	Oct. 26	27.10	8.14	17.773
Asahi	Kyoto-fu	Mai 4 May	Nov. 12	27.20	7.80	22.310
Shinriki	Mie-ken	Mai 9 May	Nov. 10	27.30	7.46	20.347
Ō-mi	Saitama-ken	Mai 13 May	Nov. 1	27.45	6.94	19.053
nriki No. 3	Aichi-ken	Mai 3 May	Nov. 7	27.45	6.94	21.111
Kameji	Shimane-ken	Avr. 21 April	Oct. 21	27.45	6.94	22.893
ameno-o	Akita-ken	Avr. 25 April	Oct. 1	27.55	6.61	22.957
Hajiguro	Okinawa-ken	Nov. 25	July 15	27.60	6.44	20.860
Sekitori	Saitama-ken	Mai 13 May	Oct. 25	28.20	4.41	18.285
kyaku-kara	Formosa	Jan. 29	July 13	28.45	3.73	17.848

Table VII. — The Activity of Catalase of the Rices which were harvested 1920 and 1919.

Variétés de riz The varieties of rice	Lieu de production The place of production	Date de l'ensemencement The time of sowing	Date de la récolte The time of harvest	Sol. $\frac{N}{10}$ de $KMnO^4$ cc. $\frac{N}{10}$ $KMnO_4$ titrated cc.	Décomposition de H^2O^2 en % Decomposed % of H_2O_2	Po... 1 gr... d... We... 1,0... gr...
Shinriki	Kumamoto-ken	1910 Mai 11 May	Oct. 28	24.35	17.46	23
Chusei-Shinriki	Kyoto-fu	Mai 3 May	Oct. 28	24.50	16.95	25
Akage	Hokkaido	Mai 10 May	Sept. 27	25.95	12.03	22
Kikushi	Formosa	Juin 14 June	Nov. 5	26.30	10.85	15
Hayashinriki	Chosen	Mai 1 May	Oct. 17	26.40	10.51	20
Hayashinriki	Chosen	1909 Mai 1 May	Oct. 24	26.40	10.51	20

Explanation of Tables IV-VII.

(1) In measuring the activity of the catalase of the samples of rice the number of rice-grains were used in each case.

(2) The activity differs widely in different varieties of rice.

(3) The activity also differs according to the locality in which the ric... produced.

(4) The activity differs widely according to the length of time that has e... between the time of harvesting the rice and the time of the experiment.

I felt that it was very important to determine the relationships betwe... activity of rice-catalase and the following factors:

(*a*) The varieties of rice.

(*b*) The locality of the production of the rice.

(*c*) The age of the stock of rice.

(*d*) The grade of polishing.

(a) *The Relationship between the Activity of Rice-catalase and the Varieties o...*

The weight of 1,000 rice-grains differs in the different varieties of rice... relationship between the activity of the catalase and the weight of 1,000 gr... shown in Table VIII. These results show that there is no relation betwe... activity and the weight of the rice-grains.

Table VIII. — The Relationship between the Activity of Catalase and the Weight of 1,000 grains.

Variétés de riz Varieties of rice	Lieu de production Place of production	Poids de 1.000 grains de riz (gr.) Weight of 1,000 rice-grains (gms.)	Décomposition de H^2O^2 en % Decomposed % of H_2O_2
tori	Saitama-ken	17.819	40.85
tori	Kanagawa-ken	19.253	38.98
i	Saitama-ken	18.645	64.41
chi	Tochigi-ken	18.724	40.68
kuryo-to	Shimane-ken	22.124	41.36
oku	Ōsaka-fu	22.126	52.71
riki	Kumamoto-ken	22.206	50.68
neno-o	Yamagata-ken	22.373	46.10
awashinriki	Kagawa-ken	24.356	69.32
okuni	Akita-ken	24.383	50.85
seishinriki	Fukuoka-ken	24.396	36.61
achi	Kagawa-ken	24.575	36.27
ochūtō	Ehime-ken	25.145	54.91
a	Ishikawa-ken	25.218	43.05
achi	Kagoshima-ken	25.275	45.42
shinriki	Hyogo-ken	26.130	57.80

he comparison of samples of the same variety of rice differing only in the locality duction is shown in Table IX. The activity of rices of the same variety is if the samples are taken from neighbouring localities, but the activity of s of the same variety differs if they are taken from localities which are far

Table IX. — The Comparison of the Activity of the Rice-Catalase of the same Variety.

Variétés de riz Varieties of rice	Lieu de production Place of production	Sol $\frac{N}{10}$ de $KMnO^4$, cc. $\frac{N}{10}$ $KMnO_4$ titrated cc.	Décomposition de H^2O^2 en % Decomposed % of H_2O_2	Poids de grains d Weigh 1,000 rice
Aikoku	Chiba-ken . . .	6.90	76.61	24.0
»	Ōsaka-fu	13.95	52.71	22.1
Shizuoka-aikoku	Shizuoka-ken . .	18.05	38 81	23.6
Aikoku No. 20 .	Fukushima-ken .	20.25	31.36	24.3
Aikoku	Miyagi-ken . . .	20.65	30.00	23.7
Shinriki	Okayama-ken . .	8.85	70.00	22.6
Kagawa-shinriki	Kagawa-ken. . .	9.05	69.32	24.3
Shin-shinriki . .	Hyogo-ken . . .	12.45	57.80	26.1
Bansei-shinriki .	Hukuoka-ken . .	13 30	54.91	22.6
» » .	Wakayama-ken .	13.80	53.22	24.7
Shinriki	Kumamoto-ken .	14.55	50.68	22.2
Haya-shinriki. .	Chōsen	16.55	43.90	20.2
Tokushima-shinriki	Tokushima-ken .	10.30	65.09	23.2
Sekitori	Gumma-ken . .	17.00	42.37	19.3
»	Saitama-ken. . .	17.45	40.85	17.8
»	Kanagawa-ken .	18.00	38.98	19.2
»	Chiba-ken . . .	19.35	34.41	18.5
Omachi	Ōsaka-fu	15.55	47.29	23.8
»	Kagoshima-ken .	16.10	45.42	25.2
»	Oita-ken	18.20	38.31	26.8
»	Kagawa-ken. . .	18.80	36.27	24.5
Kameno-o . . .	Akita-ken . . .	14.85	49.66	23.6
Iwate-kameno-o	Iwate-ken . . .	15.30	48.17	23.5
Kameno-o . . .	Yamagata-ken .	15.90	46.10	22.3
Yamagata-kameno-o	Yamagata-ken. .	16.50	44.07	22.6

b) *The Relationship between the Activity of Rice-catalase and the Locality of Production of the Rice.*

ıpan is usually divided as follows: Inland, Okinawa, Formosa, Korea (Chosen), ido and Saghalien. Inland is divided into nine divisions as follows:

Tōhoku	(6 provinces)	Kinki	(6 provinces)
Kwanto	(7 »)	Chūgoku	(5 »)
Hokuriku	(4 »)	Shikoku	(4 »)
Tōsan	(3 »)	Kyushu	(7 »)
Tōkai	(3 »)		

ıble X shows the comparison of the activities of rice-catalase from samples ed from these divisions.

ıere is no relation between the activity and the locality of the production rice. But the activity of Hokkaido rice is the strongest, while that of Formosa the weakest.

le X. — The Comparison of the Activity of the Rice-Catalase of the Same Locality.

riétés de riz rieties of rice	Lieu de production The place of production	Sol $\frac{N}{10}$ de $KMnO_4$, cc. $\frac{N}{10}$ $KMnO_4$ titrated cc.	Décomposition de H_2O_2 en % Decomposed % of H_2O_2	Poids de 1.000 grains de riz Weight of 1,000 rice-grains
	Division de Tōhoku. — Tōhoku Division.			
okuni . . .	Akita-ken . . .	14.50	50.85	24.383
ıeno-o . . .	Akita-ken . . .	14.85	49.66	23.600
ɔbei	Iwate-ken . . .	15.10	48.82	20.880
te-kameno-o	Iwate-ken . . .	15.30	48.17	23.575
ɔ No. 21 . .	Fukushima-ken .	15.45	47.63	21.313
ai No. 22 .	Fukushima-ken .	18.00	38.98	21.054
okuni . . .	Yamagata-ken .	18.25	38.14	23.996
ɔku	Miyagi-ken . . .	20.65	30.00	23.753
. . . . .	Yamagata-ken .	16.50	44.07	22.614
-wase . . .	Miyagi-ken . . .	16.50	44.07	20.893
okuni No. 2.	Yamagata-ken .	16.50	44.07	23.689
	Division de Hokuriku. — Hokuriku Division.			
ziro . . .	Nii Gata-ken . .	16.85	42.88	23.273
ı	Fukui-ken . . .	19.00	35.59	23.800
. . . . .	Ishikawa-ken . .	16.80	43.05	25.218
. . . . .	Toyama-ken. . .	13.50	54.24	17.786
.arō	Toyama-ken. . .	14.30	51.53	23.625
ziro	Toyama-ken. . .	19.50	33.90	23.329
	Division de Tokai. — Tokai Division.			
.uoka-Aikoku	Shizuoka-ken . .	18.05	38.81	23.633
ıriki No. 3	Aichi-ken	21.80	26.10	23.508

Table X. — The Comparison of the Activity of the Rice-Catalase of the Same Locality *(coutinued)*

		Division de Kwanto. — Kwanto Division.		
Aikoku	Chiba-ken . . .	6.90	76.61	24.0
Yasumura . . .	Saitama-ken. . .	8.00	72.88	22.5
Ō-mi	Saitama-ken. . .	10.05	64.41	18.6
Sekitori	Gumma-ken . .	17.00	42.37	19.3
Sekitori	Saitama-ken. . .	17.45	40.85	17.8
Sen-ichi	Tochigi-ken . . .	17.50	40.68	18.7
Sekitori	Kanagawa-ken .	18.00	38.98	19.2
Shimehari . . .	Chiba-ken . . .	18.75	36.44	20.9
Sekitori	Chiba-ken . . .	19.35	34.41	18.5
		Division de Kinki. — Kinki Division.		
Shinshinriki . .	Hyogo-ken . . .	12.45	57.80	26.1
Aikoku No. 1. .	Ōsaka-fu	13.95	52.71	22.1
Omachi	Ōsaka-fu	15.55	47.29	23.8
Omachi	Nara-ken	7 45	74.75	25.3
Aikoku No. 2. .	Ōsaka-fu	11.30	61.70	23.7
		Division de Chūgoku. — Chūgoku Division.		
Chusei-to No. 1	Hiroshima-ken. .	14.70	50.17	23.8
Shinriki	Okayama-ken . .	8.85	70.00	22.6
Chusei-to No. 2	Hiroshima-ken. .	15.95	45.93	24.4
		Division de Shikoku. — Shikoku Division.		
Kagawa-shinriki No. 1	Kagawa-ken. . .	9.05	69.32	24.3
Dōgo-chūtō . .	Ehime-ken . . .	13.30	54.91	25.1
Shinriki	Kagawa-ken. . .	19.50	33.90	24.4
Kagawa-shinriki No. 2	Kagawa-ken. . .	16.05	45.59	24.7
Tokushimashin-riki	Tokushima-ken .	10.30	65.09	24.9
Otoerami . . .	Kōchi-ken . . .	18.20	38.31	23.1

Table X. — The Comparison of the Activity of the Rice-Catalase of the Same Locality *(continued)*.

	Division de Kyushu. — Kyushu Division.			
nachi	Kagoshima-ken .	16.10	45.42	25.275
iryo-shinriki .	Fukuoka-ken . .	20.00	32.20	22.913
nsei-shinriki .	Kumamoto-ken .	13.30	54.91	22.693
nriki	Kumamoto-ken .	14.55	50.68	22.206
nachi	Ōita-ken	18.20	38.31	26.885
nto-shinriki .	Fukuoka-ken .	18.70	36.61	24.396
nkei	Ōita-ken	12.25	58.48	27.359
jiguro . . .	Okinawa-ken . .	15.00	49.15	19.732
	Division de Hokkaido. — Hokkaido Division.			
age	Hokkaido . . .	7.20	75.59	20.937
zu No. 5. . .	Hokkaido . . .	8.05	72.71	23.220
	Mandchourie. — Manchuria.			
kōtōji . . .	Manchuria . . .	6.55	77.80	23.302
meno-o . . .	Manchuria . . .	16.05	45.59	22.965
meno-o . . .	Manchuria . . .	11.50	61.02	23.003
	Formose. — Formosa.			
kyaku-kara No. 1	Taihoku	26.95	8.64	17.496
kyaku-Kara No. 2	Taihoku	23.50	20.34	23.508
	Chōsen. — Chōsen.			
ashinriki No.1	Suigen	16.55	43.90	20.206
ashinriki No.2	Suigen	19.40	34.24	20.232

(c) *The Relationship between the Activity of Rice-catalase and the Age of the Stock of Rice.*

In order to follow the changes in the activity of rice-catalase, I determ the activity twice, the first time in the December of the year in which the rice harvested, and the second time in December of the next year. The rice was s carefully in a natural state during the year. The results are shown in Table XI

Table XI. — The Change of the Activity of Rice-Catalase during One Y

Variétés de riz Varieties of rice	Lieu de production Place of production	Riz nouveau New rice		Riz conservé penda une année Rice preserved one y	
		Sol. $\frac{N}{10}$ de $KMnO_4$, cc. $\frac{N}{10}$ $KMnO_4$ titrated, cc.	Décomposition de H^2O^2 en % Decomposed % of H_2O_2	Sol. $\frac{N}{10}$ de $KMnO_4$, cc. $\frac{N}{10}$ $KMnO_4$ titrated, cc.	Décom tion de en Decomp % of
Aikoku	Aichi-ken . . .	10.05	64.41	21.35	27.
Chūsei-to . .	Hiroshima-ken .	14.70	50.17	22.60	23.
Toyokuni . . .	Akita-ken . . .	14.50	50.85	22.90	22.
Toyokuni . . .	Yamagata-ken .	16.50	44.07	23.35	20.
Kameno-o. . .	Akita-ken . . .	14.85	49.66	22.05	25.
Kameno-o. . .	Manchuria . . .	16.05	45.59	22.95	22.
Omachi . . .	Kagoshima-ken	15.55	47.29	22.75	22.
Omachi . . .	Nara-ken . . .	15.55	47.29	21.05	28.
Shinriki . . .	Fukuoka-ken .	16.00	45.76	21.25	27.
Shinriki . . .	Kumamoto-ken	13.30	54.91	21.80	26.
Shinriki . . .	Mie-ken	13.80	53.22	23.30	21.
Sekitori . . .	Kanagawa-ken .	17.65	40.65	22.85	22.
Sekitori . . .	Gumma-ken . .	17.00	42.37	24.00	18.
Sekitori . . .	Saitama-ken . .	17.45	40.85	23.45	20.
Sen-ichi . . .	Tochigi-ken . .	17.50	40.68	22.55	23.
Tō-go.	Fukushima-ken .	15.45	47.63	21.80	26.
Fuji	Shiznoka-ken .	14.70	50.17	23.40	20.
Dōgo-chūtō .	Ehime-ken . . .	13.30	54.91	23.00	22.
Bōzu No. 5 . .	Hokkaido . .	8.05	72.71	19.35	34.
Hayashinriki .	Chōsen	16.55	43.89	24.05	18.

The change of activity measured bi-monthly is shown in Table XII. Figure I gives the results of Table XII.

'he activity diminishes gradually during storage. The diminution of activity
; most rapidly after May of the year following the harvesting. The amount
lrogen peroxide decomposed is reduced to about one-half in a year. The course
diminution of activity in the following year is the same.

able XII. — THE CHANGE OF THE ACTIVITY OF RICE-CATALASE WHICH WAS MEASURED BI-MONTHLY

etés de riz ties of Rice	Aikoku		Kameno-o		Omachi		Sekitori		Shinriki	
Mois Month	$\frac{N}{10}$ $KMnO_4$ cc.	Décomposé Decomposed %	$\frac{N}{10}$ $KMnO_4$ cc.	Décomposé Decomposed %	$\frac{N}{10}$ $KMnO_4$ cc.	Décomposé Decomposed %	$\frac{N}{10}$ $KMnO_4$ cc.	Décomposé Decomposed %	$\frac{N}{10}$ $KMnO_4$ cc.	Décomposé Decomposed %
ember . .	10.05	64.41	14.85	49.66	15.55	47.29	17.50	40.68	13.30	54.91
uary. . .	11.00	62.54	15.10	48.81	15.55	47.29	17.70	40.00	13.40	54.57
h . . .	12.05	59.15	15.30	48.17	15.90	46.10	18.00	38.98	13.60	53.89
. . . .	13.30	54.91	15.90	46.10	17.00	42.37	18.25	38.14	14.30	51.87
. . . .	17.30	41.36	17.60	40.45	19.65	33.39	19.35	34.40	16.55	43.90
ember. .	20.65	30.00	20.00	32.20	22.05	25.25	22.20	24.74	19.80	32.88
mber . .	21.35	27.53	22.05	25.25	22.75	22.88	22.85	22.54	21.80	26.10
ary. . .	21.80	26.10	22.70	23.05	23.25	21.19	22.85	22.54	22.05	25.25
h . . .	22.70	23.05	23.45	20.51	24.00	18.98	23.00	22.03	22.05	25.25
. . . .	23.60	20.00	24.90	15.59	25.70	12.88	23.00	22.03	24.00	18.98
. . . .	25.95	12.03	27.45	6.61	26.40	10.51	26.15	11.36	25.20	14.58
ember. .	27.10	8.14	27.45	6.61	26.90	8.81	26.40	10.51	26.40	10.51
mber . .	27.25	7.63	27.45	6.61	26.90	8.81	27.10	8.14	27.30	7.46

(d) *The Relationship between the Activity of Rice-catalase and the Grade of Polishing.*

used three varieties of rice, each of which was divided into the four following according to the grade of polishing:

(*a*) Unpolished rice.
(*b*) 50%-polished rice.
(*c*) 70%-polished rice.
(*d*) Polished rice (white rice).

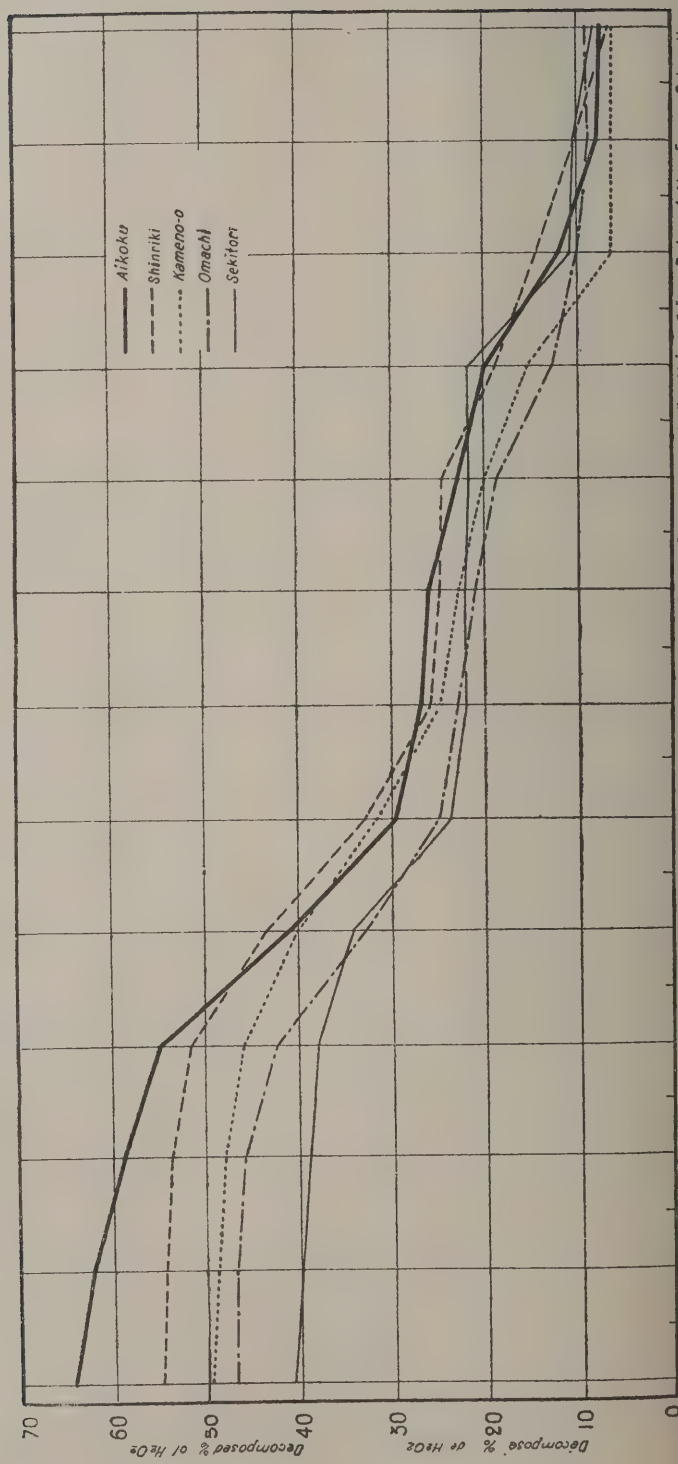


Fig. I. — The Change of the Activity of Rice-catalase during two Years.

[determined the activity of each sample; the results are shown in Table XIII Figure II.

The activity diminishes according to the grade of polishing; the activity of ıed rice is about one-fifth or one-sixth of that of unpolished rice.

The comparison of the activities of unpolished and polished rice is shown in ; XIV.

able XIII. — The Activity of the Catalase of the Rices which differ from the Grade of Polishing.

	Shonai rice			Niigata rice			Miyagi rice		
	$\frac{N}{10}$ $KMnO_4$ Titré - Titrated	Décomposé % de H^2O^2 Decomposed % of H_2O_2	Poids de 1000 grains Weight of 1000 grains	$\frac{N}{10}$ $KMnO_4$ Titré - Titrated	Décomposé % de H_2O_2 Decomposed % of H_2O_2	Poids de 1000 grains Weight of 1000 grains	$\frac{N}{10}$ $KMnO_4$ Titré - Titrated	Décomposé % de H^2O^2 Decomposed % of H_2O_2	Poids de 1000 grains Weight of 1000 grains
non glacé . } polished rice }	16.80	43.05	22.616	15.85	46.27	22.975	14.50	50.85	21.767
glacé à 50% . } polished rice }	24.35	17.46	21.804	23.65	19.83	22.043	23.00	22.03	21.240
glacé à 70% } polished rice }	26.25	11.02	21.583	26.00	11.86	21.595	26.15	11.36	20.690
glacé . . . } shed rice . }	27.50	6.78	20.628	27.35	7.29	21.109	26.85	8.98	20.340

The Figure of the Results of Table XIII.

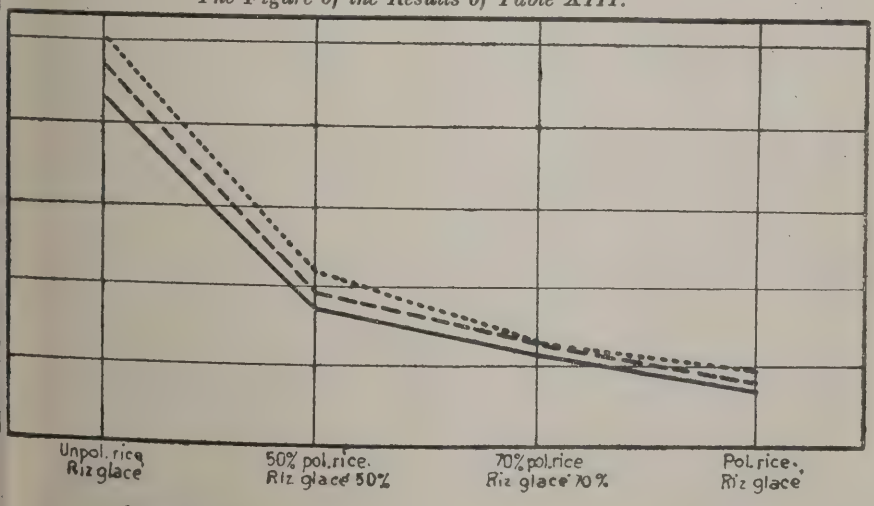


Table XIV. — Comparison of the Activity of the Catalase of Unpolished an Polished Rice.

Variétés de riz Varieties of rice	Lieu de production The place of production	Année de récolte The year harvested	Riz non glacé Unpolished rice			Riz glacé Polished rice		
			Sol $\frac{N}{10}$ de $KMnO^4$ cc. $\frac{N}{10}$ $KMnO_4$ titrated cc.	Décomposition de H^2O^2 en% Decomposed % of H_2O_2	Poids de 1.000 grains de riz Weight of 1,000 grains	Sol $\frac{N}{10}$ de $KMnO^4$ cc. $\frac{N}{10}$ $KMnO^4$ titrated cc.	Décomposition de H^2O^2 en % Decomposed % of H_2O_2	Poi... 1... gr. de We... of 1... gr.
Gorobei	Iwate-ken	1924	15.10	48.82	20.880	27.55	6.61	19...
Toyokuni	Akita-ken	1923	22.90	22.37	22.373	28.20	4.41	20...
Toyokuni	Akita-ken	1924	14 50	50.85	24.383	27.30	7.46	20...
Ishiziro	Niigata-ken	1923	20.80	29.49	22.047	28.50	3.39	20...
Ishiziro	Niigata-ken	1924	16.85	42.88	23.273	28.45	3.56	17...
Dŏgowase	Ehime-ken	1923	24.40	17.29	22.988	28.40	3.73	22...
Dŏgowase	Ehime-ken	1924	21.40	27.46	22.800	27.60	6.44	21...
Dŏgochŭtŏ	Ehime-ken	1923	14.30	51.87	27.746	28.35	3.89	22...
Dŏgochŭtŏ	Ehime-ken	1924	13.30	54.91	25.145	25.85	5.59	22...
Dŏgobantŏ	Ehime-ken	1923	16.25	44.92	25.754	28.30	4.07	21...
Dŏgobantŏ	Ehime-ken	1924	23.00	22.03	24.458	27.70	6.10	22...
Hajiguro	Okinawa-ken	1922	27.60	6.44	20.860	28.75	2.54	19...
Hajiguro	Okinawa-ken	1923	25.35	14.07	21.308	28.40	3.73	19...
Hajiguro	Okinawa-ken	1924	24.90	15.59	19.990	27.80	5.76	19...

Table XV. — The Activity of the Catalase of Polished Rice.

Variétés de riz Varieties of Rice	Lieu de production Place of production	Sol. $\frac{N}{10}$ de $KMnO_4$, c.c. $\frac{N}{10}$ $KMnO_4$ titrated c.c.	Décomposition de H^2O^2 en % Decomposed % of H_2O_2
kitori	Kanagawa-ken	26.85	8.98
n-ichi	Tochigi-ken	28.30	4.07
-mi	Saitama-ken	28.20	4.41
ibō-aikoku	Saitama-ken	27.10	8.14
kitori	Gumma-ken	27.75	5.32
iratama	Kanagawa-ken	28.45	3.56
mehari	Chiba-ken	27.10	8.14
koku	Chiba-ken	27.35	7.29
ijinishiki	Yamanashi-ken	28.35	3.89
kasago	Yamanashi-ken	28.40	3.73
gokuni	Yamagata-ken	27.30	7.46
gō	Fukushima-ken	28.40	3.73
meno-o	Akita-ken	27.45	6.94
meno-o	Yamagata-ken	27.20	7.79
ate-kameno-o	Iwate-ken	27.30	7.46
a	Toyama-ken	27.60	6.44
ijiro	Nügata-ken	27.35	7.29
ijiro	Toyama-ken	26.00	11.86
tarō	Toyama-ken	27.30	7.46
bōzu	Toyama-ken	27.20	7.78
riki	Mie-ken	28.35	3.73
riki	Aichi-ken	28.50	3.39
ga-shinriki	Shiga-ken	28.20	4.41
achi	Ōsaka-fu	27.45	6.94
shinriki	Wakayama-ken	28.10	4.75
-erami	Kōchi-ken	28.20	4.41
sei-to	Hiroshima-ken	26.25	11.02
uryo-to	Shimane-ken	27.95	5.25
ichi	Kagoshima-ken	27.55	6.61
riki	Fukuoka-ken	27.60	6.44
ichi	Ōita-ken	28.45	3.56
yakukara	Formosa	27.30	7.46
ashinriki	Chōsen	27.25	7.63
No. 5	Hokkaido	26.85	8.98
ge	Hokkaido	27.10	8.14

The activities of polished rices collected from all over Japan are shov Table XV. It is seen that the activity of polished rice is always weak and variable.

Dr. Fujimaki and Matsumuro have found that the quantity of vitamin diminished by the storage of rice and by the different grades of polishing. We f that the decrease of vitamin B ran approximately parallel to the decrease of cat activity. It might therefore be possible to estimate the quantity of vitamin rice by means of the catalase reaction.

Conclusions.

(1) The activity of the catalase of rice differs widely in different variet rice and varies according to the locality in which the rice is produced.

(2) The activity of samples of the same variety of rice is similar if the taken from neighbouring localities; but the activity of samples of rices of the variety differ if they are taken from localities which are far apart.

(3) The activity of Hokkaido rice is the strongest, while that of Fo rice is the weakest.

(4) Even when the same variety is produced in the same locality, the ac varies according to the length of time the rice has been stored.

(5) There is no relation between the activity and the weight of the rice g

(6) The activity of the catalase of rice varies according to the grade of poli

(7) The diminution in the activity of the catalase during a year's storag parallel with the decrease of vitamin B content of the rice.

The results of the experiments performed on rice-catalase by Noguchi, Ōhara Institute for Agriculture, are quite different from my own. In all the ca reactions I used the same number of rice-grains, so that I was able to dete exactly the change in the activity of the catalase during the period of stor the rice. All the experiments were made on rice kept in a natural state.

Experiments are still being continued on the relationship between the ac of the catalase and the state of moisture in which the rice is kept.

14.

E RELATIONSHIP BETWEEN THE CHEMICAL COMPOSITION OF RICE AND ITS DIFFERENT GRADES OF POLISHING.

By

Taro Higuchi, Mitsuyuki Kondo, Minoru Hara, Shinkichi Narita and Kunio Matsuzawa

(From the Imperial State Institute for Nutrition, Tokyo).

Introduction.

olished rice is the principal food of the Japanese; it is more digestible and utilised in the body than unpolished rice, and it has a pleasanter taste. In , many people used to consume about half-polished rice, but recently they become accustomed to using finely polished rice. The food value of polished less, because part of the rice grain is lost by polishing. There are good reasons commending the Japanese people to acquire the habit of using only partially ed rice. We have studied the deterioration of rice produced by different grades ishing and present our results in this report.

Experimental Methods.

Ve used the polishing machine of the Institute for polishing the experimental Each sample of rice was divided into the four following fractions according to ade of polishing:

) *Unpolished rice.* — Rice from which the husk had been removed, but which tained the outer layer, or silver skin, and the embryo or germ.

) 50%-*polished rice.* — Rice which had been milled and polished but which ed half of the outer layer and germ.

) 70%-*polished rice.* — Rice which still retained about 30 per cent of the layer and germ.

) *Polished rice (white rice).* — Rice which had been polished perfectly, so he germ was almost entirely rubbed off in the milling.

We collected a number of samples, and a few characteristic varieties of rice taken for analysis.

No. I. Shonai rice (rice of 3rd class A).
No. II. Miyagi rice (rice of 2nd class).
No. III. Niigata rice (rice of 1st class).
No. IV. Shonai rice (rice of 3rd class B).

Each sample of rice was powdered and an investigation was made of its che components. The analysis was made by the methods given in the book "Anal Methods of Agricultural Chemistry", published by the Agricultural College o Tokyo Imperial University (1921).

Experiment I.

Sample: Shonai rice A. The results of analysis are shown in Table I.

Table I.

	Eau Water	Protéine Protein	Graisse Fat	Cendres Ash	Cellulose Fibre	Hyd de c Car hydr
Riz non glacé . . . Unpolished rice . .	15.05	7.50	2.39	1.31	1.79	71.
Riz glacé à 50% . . 50% polished rice . .	15.19	6.67	1.29	0.78	0.92	75.
Riz glacé à 70% . . 70% polished rice . .	15 28	6.37	1.00	0.58	0.66	76.
Riz glacé . . . . . Polished rice . . .	15.18	6.24	0.50	0.46	0.36	77.

That is, protein, fat, ash and fibre are gradually diminished by the gra polishing.

We compared the components of the rice of each grade of polishing with of unpolished rice (100), as shown in Table II.

Table II.

	Protéine Protein	Graisse Fat	Cendres Ash	Cellulo Fibr
Riz non glacé . . . . . Unpolished rice	100.00	100.00	100.00	100.0
Riz glacé à 50% . . . . . 50% polished rice	88.93	53.97	59.54	51.4
Riz glacé à 70% . . . . . 70% polished rice	84.93	41.84	44.27	36.8
Riz glacé . . . . . Polished rice	83.20	20.92	35.11	20.1

Experiment II.

Sample: Miyagi rice. The results of analysis are shown in Table III.

Table III.

	Eau Water	Protéine Protein	Graisse Fat	Cendres Ash	Cellulose Fibre	Hydrates de carb. Carbo-hydrates
z non glacé . . . ıpolished rice . .	14.45	8.24	2.11	1.26	1.37	72.57
z glacé à 50% . . % polished rice . .	14.53	8.12	2 04	1.24	1.32	72.75
z glacé à 70% . . % polished rice . .	14.75	7.99	1.77	1.11	1.07	73.31
z glacé . . . . . lished rice . . .	15.36	7.52	0.94	0.71	0.69	74.78

We compared the components of the rice of each grade of polishing with those polished rice (100), as shown in Table IV.

Table IV.

	Protéine Protein	Graisse Fat	Cendres Ash	Cellulose Fibre
: non glacé . . . . . polished rice	100.00	100.00	100.00	100.00
: glacé à 50% . . . . . % polished rice	98.54	96.68	98.41	96.35
: glacé à 70% . . . . . % polished rice	96.97	83.89	88.10	78.10
: glacé . . . . . ished rice	91.26	44.55	56.35	50.36

Experiment III.

ample: Niigata rice. The results are shown in Table V.

Table V.

	Eau Water	Protéine Protein	Graisse Fat	Cendres Ash	Cellulose Fibre	Hydrates de carb. Carbo-hydrates
non glacé . . . polished rice . .	14.75	7.40	2.34	1.25	1.29	72.97
glacé à 50%. . . o polished rice . .	14.97	7.00	1.45	0.88	0.60	75 10
glacé à 70% . . o polished rice . .	15.16	6.66	1.30	0.75	0.48	75.65
glacé . . . . . ished rice . . .	15.33	6.56	0.78	0.53	0.45	76.35

We compared the components of the rice of each grade of polishing with t
of unpolished rice (100), as shown in Table VI.

Table VI.

	Protéine Protein	Graisse Fat	Cendres Ash	Cellulo Fibre
Riz non glacé . . . . . Unpolished rice	100.00	100.00	100.00	100.0
Riz glacé à 50% . . . . . 50% polished rice	94.59	61.97	70.40	46.5
Riz glacé à 70% . . . . . 70% polished rice	90.00	55.56	60.00	37.2
Riz glacé . . . . . Polished rice	88.65	33.33	42.40	34.8

Experiment IV.

Sample: Shonai rice B. The results of analysis are shown in Table VII

Table VII.

	Eau Water	Protéine Protein	Graisse Fat	Cendres Ash	Cellulose Fibre	Hydr de c Car hydr
Riz non glacé . . . Unpolished rice . .	15.37	7.19	2.66	1.39	1.50	76.
Riz glacé à 50% . . 50% polished rice . .	15.65	6.69	1.88	0.99	1.16	73.
Riz glacé à 70% . . 70% polished rice . .	15.85	6.50	1.18	0.70	1.09	74.
Riz glacé . . . . . Polished rice . . .	15.81	6.00	0.50	0.51	0.73	76.

We compared the components of the rice of each grade of polishing with those polished rice (100), as shown in Table VIII.

Table VIII.

	Protéine Protein	Graisse Fat	Cendres Ash	Cellulose Fibre
z non glacé . . . . . polished rice	100.00	100.00	100.00	100.00
z glacé à 50% . . . . . % polished rice	93.05	70.68	71.22	77.33
z glacé à 70% . . . . . % polished rice	90.40	44.36	50.36	72.67
z glacé . . . . . lished rice	83.45	18.79	36.69	48.67

Figures I to IV show the comparison of the quantity of each component of ices of the different grades of polishing in Experiments I to IV.

Fig. I. — Comparison of the Quantity of Protein in the Rices of Different Grades of Polishing.

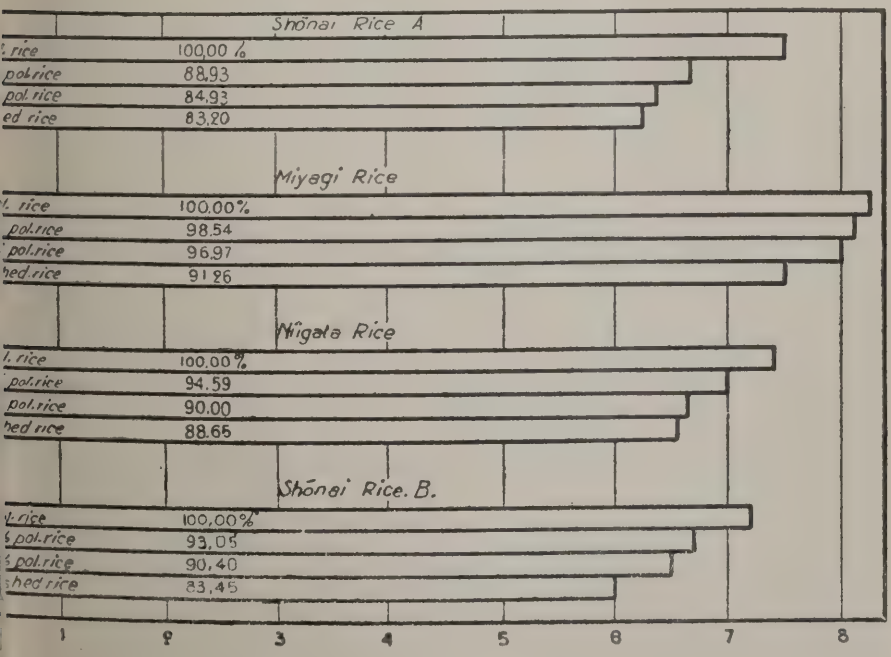


Fig. II. — Comparison of the Quantity of Fat in the Rices of Different Grades of Polishing

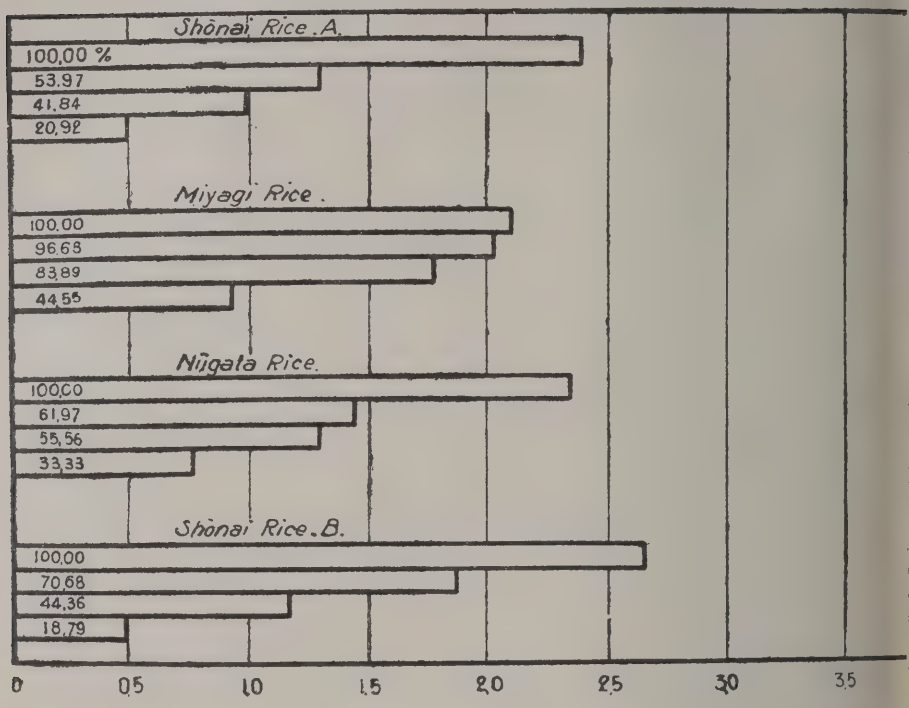


Fig. III. — Comparison of the Quantity of Ash in the Rices of Different Grades of Polishing.

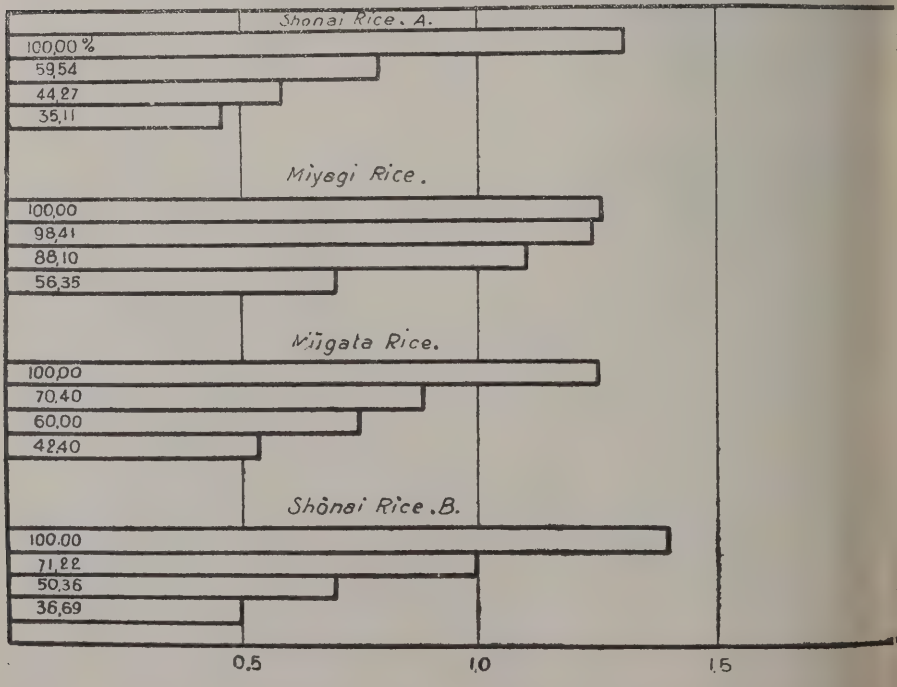
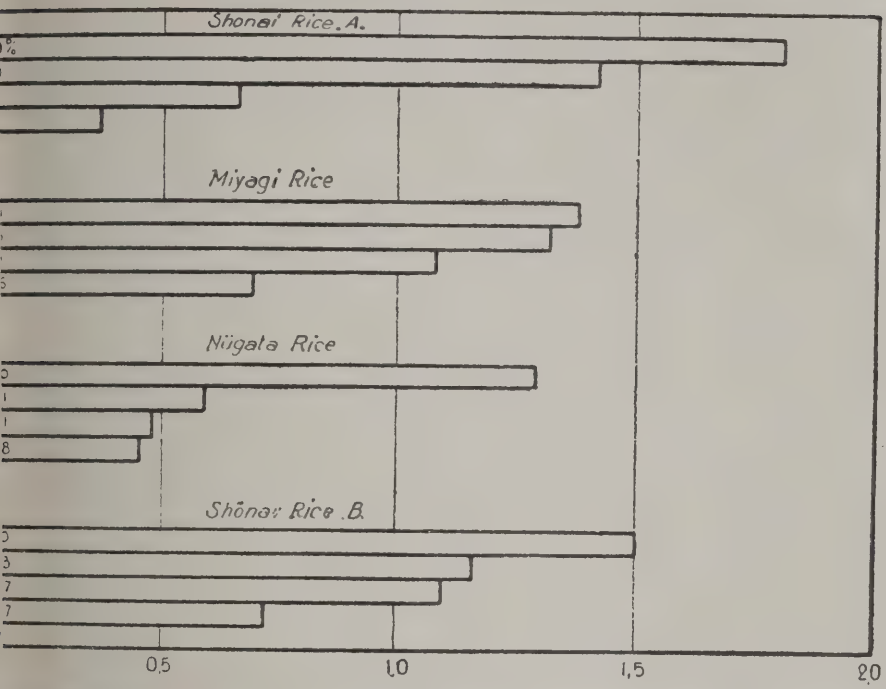


Fig. IV. — Comparison of the Quantity of Fibre in the Rices of Different Grades of Polishing.



able IX shows the loss (per cent) of each chemical component of the rices in ferent grades of polishing.

Table IX.

	Protéine Protein	Graisse Fat	Cendres Ash	Cellulose Fibre
Riz non glacé Unpolished rice	0.00	0.00	0.00	0.00
Riz glacé à 50% 50% polished rice	11.07	46.03	40.46	48.60
Riz glacé à 70% 70% pol. rice	15.07	58.16	55.73	63.13
Riz glacé Polished rice	16.80	79.08	64.89	79.89
Riz non glacé Unpolished rice	0.00	0.00	0.00	0.00
Riz glacé à 50% 50% pol. rice	1.46	3.32	1.59	3.65
Riz glacé à 70% 70% pol. rice	3.03	16.11	11.90	21.90
Riz glacé Polished rice	8.74	55.45	43.65	49.64

Table IX *(continued).*

		Protéine Protein	Graisse Fat	Cendres Ash	Cellu Fil
Riz de Niigata Niigata rice	Riz non glacé Unpolished rice	0.00	0.00	0.00	0
	Riz glacé à 50% 50% pol. rice	5.41	38.03	29.60	53
	Riz glacé à 70% 70% pol. rice	10.00	44.44	40.00	62
	Riz glacé Polished rice	11.35	66.67	57.60	65
Riz B de Shōnai Shōnai rice B	Riz non glacé Unpolished rice	0.00	0.00	0.00	0
	Riz glacé à 50% 50% pol. rice	6.95	29.32	28.78	22
	Riz glacé à 70% 70% pol. rice	9.60	55.64	49.64	27
	Riz glacé Polished rice	16.55	81.21	63.31	51

Summary of Experiments I to IV.

(1) Protein is slightly diminished by polishing.

(2) Fat, ash and fibre are greatly diminished by polishing.

(3) Carbohydrates are slightly increased and the other nutrients are dimi

(4) The grade of polishing differs from the varieties of rice.

The germ is an important part of rice as it contains vitamin B. So we avoid its removal by polishing; the polished rice used in the city contains n It has been already proved that the rice germ also contains a great deal of phos

The most noteworthy nutrients lost by polishing are the inorganic subs we have therefore analysed the inorganic substances of rice. The compon the inorganic substances of rice (Shonai rice B) are shown in Table X. (The are the percentages in ash.)

Table X.

Riz Rice	Non glacé Unpolished	Glacé à 50 % 50 % polished	Glacé à 70 % 70 % polished	Glacé Polished
K_2O	11.76	10.94	11.20	13.30
Na_2O	4.03	3.79	3.64	5.80
CaO	1.66	1.29	1.35	3.23
MgO	6.75	6.61	6.54	5.74
P_2O_5	73.36	75.03	75.07	69.83
SO_2	0.25	0.23	0.22	0.18
SiO_2	2.13	2.00	1.92	1.84
Fe_2O_3	0,06	0.05	0.05	0.04
Cl	+	+	+	+

he figures of Table XI are the percentage in rice.

Table XI.

Riz Rice	Non glacé Unpolished	Glacé à 50 % 50 % polished	Glacé à 70 % 70 % polished	Glacé Polished
K_2O	0.16	0.11	0.08	0.07
Na_2O	0.06	0.04	0.03	0.03
CaO	0.02	0.01	0.01	0.01
MgO	0.09	0.06	0.04	0.03
P_2O_5	1.02	0.74	0.53	0.36
SO_2	0.0035	0.0023	0.0015	0.0009
SiO_2	0.0296	0.0198	0.0134	0.0094
Fe_2O_3	0.0008	0.0005	0.0004	0.0002
Cl	+	+	—	+

Explanations of Tables X and XI.

) The order of quantity is P_2O_5, K_2O, MgO, Na_2O, SiO_2 and CaO.
) The phosphorus content in ash is over 70 per cent in the form of P_2O_5.

Next we studied the content of phosphorus in rices of different grad polishing. The results are shown in Table XII.

Table XII.

Riz — Rice	Shōnai A	Miyagi	Niigata	Shōnai
Riz non glacé . . . . . Unpolished rice	0.92	0.85	0.81	1.02
Riz glacé à 50% . . . . . 50% polished rice	0.73	0.81	0.68	0.74
Riz glacé à 70% . . . . . 70% polished rice	0.54	0.65	0.55	0.53
Riz glacé . . . . . Polished rice	0.40	0.52	0.43	0.36

The percentage of phosphorus compared with unpolished rice (as 100 per is shown in Table XIII.

Table XIII.

Riz — Rice	Shōnai A	Miyagi	Niigata	Shōnai B	Moye Me
Riz non glacé . . . . Unpolished rice . . .	100.00	100.00	100.00	100.00	100
Riz glacé à 50% . . . 50% polished rice . .	79.35	95.29	83.95	72.55	80
Riz glacé à 70% . . . 70% polished rice . .	58.70	76.47	67.90	51.96	65
Riz glacé . . . . . Polished rice	43.48	61.18	53.09	35.29	45

Explanations of Tables XII and XIII.

The amount of phosphorus in 50%-polished rice is about 80 per cent of in unpolished rice; in 70%-polished rice it is 65 per cent, and in polished rice 45 per cent.

The germ of the rice kernel (the embryo of the seeds) is richest in the ant beri substance. It is suggested that the loss of the germ of the rice kernel than that of the outer layer is the cause of the loss of the protective power a beri-beri. The germ, the phosphorus and vitamin B are all related to each because, as we polish rice, the germ is gradually lost and the vitamin B conter the phosphorus content are diminished at the same time. Can we determine the

ishing of rice from its phosphorus content ? To solve this problem we made an sis of the phosphorus content of many famous Japanese varieties of rice. The s are shown in Table XIV.

Table XIV.

Variétés de riz Varieties of rice	Riz non décortiqué Unpolished rice	Riz glacé à 50% correspond à 80% de P^2O^5 du riz non glacé 50% pol. rice as 80% of P_2O_5 of unpol. rice	Riz glacé à 70% correspond à 65% de P^2O^5 du riz non glacé 70% pol. rice as 65% of P_2O_5 of unpol. rice	Riz glacé correspond à 45% de P^2O^5 du riz non glacé Pol. rice as 45% of P_2O_5 of unpol. rice
	%	%	%	%
ijinishiki	1.360	1.088	0.884	0.612
meno-o	1.115	0.892	0.725	0.502
oku	1.034	0.827	0.672	0.465
ijinishiki	1.020	0.816	0.663	0.459
ɔnai II	1.020	0.816	0.663	0.459
nriki	0.989	0.791	0.643	0.445
nriki III	0.989	0.791	0.643	0.445
a	0.984	0.787	0.639	0.443
ı-ichi	0.958	0.766	0.623	0.431
ıseimiyako	0.953	0.762	0.619	0.429
meno-o	0.952	0.761	0.618	0.428
nriki	0.949	0.759	0.613	0.427
kyaku	0.929	0.743	0.604	0.418
ɔnai I.	0.920	0.736	0.598	0.414
ŏ	0.908	0.726	0.590	0.409
nriki A	0.902	0.722	0.586	0.406
-zu	0.889	0.711	0.578	0.400
yokuni	0.885	0.708	0.573	0.398
ijiro	0.870	0.696	0.566	0.392
ıdai	0.850	0.680	0.553	0.383
itori	0.841	0.673	0.547	0.378
ıachi	0.832	0.666	0.541	0.374
ŏsen	0.832	0.666	0.541	0.374
gata	0.810	0.648	0.527	0.365
Mean	0.950	0.760	0.617	0.427

That is, the mean phosphorus content in many varieties of rice in Jap 0.950% in unpolished rice, 0.760% in 50%-polished rice, 0.617% in 70%-poli rice, and 0.427% in polished rice.

Table XV shows the phosphorus content in the commercial white rices in the rices washed with water.

Table XV.

	Riz glacé Polished rice	Riz lavé Washed rice
	%	%
Sen-ichi (Tochigi)	0.666	0.359
Shinriki (Ehime)	0.639	0.423
Omachi (Nara)	0.614	0.372
Omachi (Kagoshima)	0.604	0.359
Shōnai (Yamagata)	0.569	0.346
Kameno-o (Yamagata).	0.566	0.385
Bōzu (Hokkaido)	0.534	0.397
Sekitori (Mie)	0.495	0.423

Commercial polished rice usually contains 0.4 to 0.5 per cent of phosphorus washed rice contains 0.35 to 0.4 per cent.

Summary and Conclusion.

(1) We investigated the diminution in the amounts of the chemical componen rice produced by different grades of polishing.

(2) Protein is slightly diminished, while fat, ash and fibre are greatly diminis by polishing.

(3) None of the chemical components are entirely removed by polishing.

(4) There is a great difference in the chemical composition of rices of diff varieties but of the same grade of polishing.

(5) Phosphorus is an important component of rice; the amount differs greatly ac ing to the variety of rice.

(6) Recently, the resolution that rice containing less than 0.4 per cent of phosp should be excluded by law from those countries in which this cereal fo the principal food-grain was recognised by the Far-Eastern Associatio Tropical Medicine. There are many good reasons for recommending the u 70%-polished rice, from both the physiological and the economical standp

70%-polished rice contains about 0.5 to 0.8 per cent of phosphorus, while the shed rice on the market, especially in the cities, contains about 0.4 per cent sphorus.

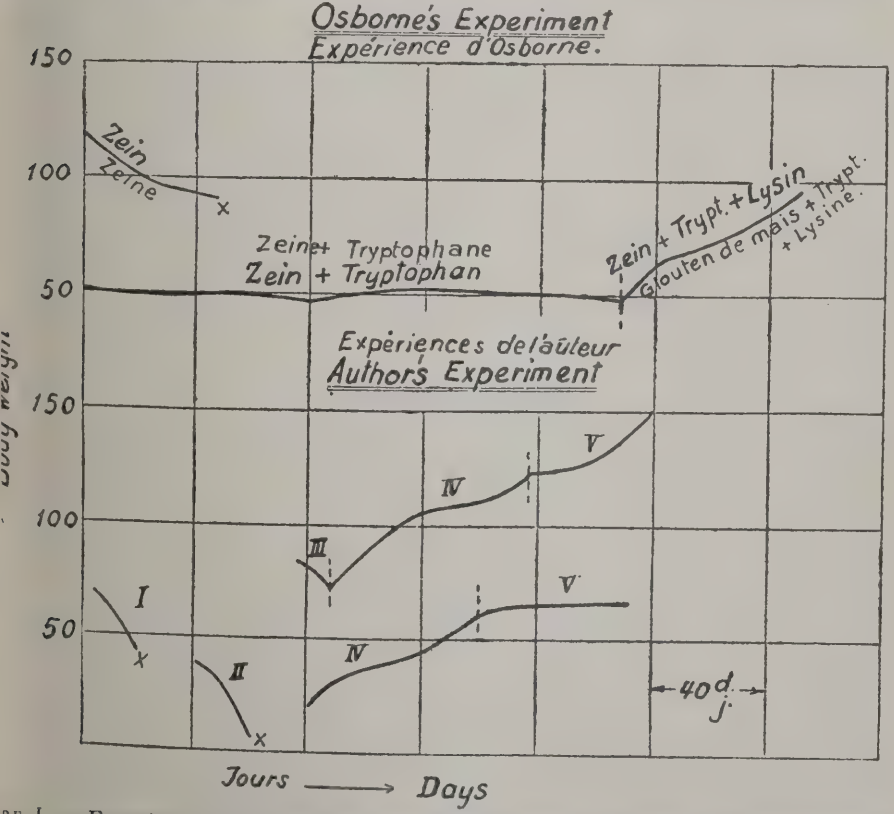
Work is now in progress concerning the chemical nature of the bran and the n of the rice kernel. These substances are removed by polishing and are important ors in determining the nutritional value of rice.

THE RELATIVE NUTRITIVE VALUE OF VARIOUS PROTEINS CONTAINED IN JAPANESE FOOD ARTICLES.

By Umetaro Suzuki,
Yoshihiko Matsuyama and Nabetaro Hashimoto
(From the Institute of Physical and Chemical Research, Tokyo).

1. Introduction.

During the past few years we have been carrying out studies on the constituents Japanese food articles, including proteins, fats, carbohydrates, mineral salts, mins, etc. In the present paper we will deal only with the protein constituents.



RE I. — Experiments with zein and gelatine, showing the effect of the addition of certain amino acids to the proteins of low nutritive value.
III, gelatine; IV, V, each 0.1% cystine, tyrosine and tryptophan added; VI, tyrosine removed

Our experimental data have partly been reported in the *Journal of the Japan Chemical Society:* Vols. XL and XLI, in co-operation with Y. Okuda, T. Okimo M. Iwata, K. Katakura and Z. Terada.

We employed for our experiments the method adopted by Osborne, Mendel a others, using albino rats. Feeding experiments with gelatine were made; the follo ing diet was given: Gelatine 14 %, butter 28 %, protein-free milk 28 %, starch 30

Additions of certain amino acids were made in the case of some of the anima as will be seen in Figure I.

Curves I and II show that the rats receiving no additions died in 8 and 16 d respectively. The omission of tyrosin did not produce any remarkable effect growth. This was probably due to the presence in gelatine of phenylalanin, wh perhaps plays the same rôle as tyrosine. If either cystine or typtophane w removed from the diet growth suddenly declined, and the animals finally died.

Thus it was proved that the nutritive value of proteins can be improved by addition of certain amino acids which may be lacking in the protein molecule.

1. Physiological Rôle of Amino Acids.

We are now faced with the question: What kinds of amino acids are necess for the nutrition of animals? By feeding experiments it has been shown that cysti lysine and typtophane are indispensable. Cystine is easily converted into cyste by reduction. A peptide-like combination of cysteine and glutaminic acid (glu thione) was reported by Hopkins to be widely distributed in animal tissues, and play an important rôle in cell metabolism. Cystine is changed to cysteinic acid oxidation, and the latter can be converted into taurine by splitting off carbo acid. Taurine is also widely distributed in animal tissues, and forms an import component of bile acids, *e.g.*, taurocholic acid. In feeding experiments carried with gelatine we once administered cysteine to the rats instead of cystine and fo that the former was as well utilised as the latter; cysteinic acid and taurine w unable to replace cystine.

Recently a new thio-amino acid having the formula $C_5H_{11}NSO_2$ (melting-p 272°) was isolated by J. H. Müller from the hydrolytic products of various prote S. Odake in our laboratory isolated the same substance from an alcoholic extr of yeast. Still another sulphur compound was obtained by us from yeast; it has formula $C_{11}H_{15}N_5SO_4$ (melting-point 208°) and it is easily hydrolysed into ade ($C_5H_5N_5$) and a thio-sugar ($C_6H_{12}SO_4$). The rôle of these compounds in metabol remains to be investigated.

Recently we have fed young chickens with artificial food mixtures and h observed the beneficial effect of cystine upon the growth of their feathers and upon the increase of their weight. Kimura obtained the same result with albino in his feeding experiments with " Kaoliang " (Manchurian millet). It would worth while to test its effect upon the growth of wool.

Tyrosine and phenylalanine are closely related compounds; both contai benzene nucleus but there is no OH group in phenylalanine. The animal bod certainly not able to synthesise the benzene nucleus, so that, if these two substa were both absent in the food, the animal could not survive. Tyrosine can, howe be replaced by phenylalanine, because the introduction of an OH group into the benz nucleus can easily be effected in the body. Gelatine does not contain tyrosine, according to our experiments, rats can grow tolerably well without it. This migh

to the presence of phenylalanin, which perhaps proved an effective substitute yrosine.

Lysine is diamino-capronic acid and closely resembles in its structure nor- ine (caprin) obtained from the proteins of brain tissue by Abderhalden. Lately, as been shown by feeding experiments that nor-leucine can replace lysine in the y. If this is true, lysine would serve for the building up of brain substance.

It would be interesting to determine whether the laying of eggs by hens is rolled by the amount of diamino acids, especially by that of lysine, contained he food. It is quite evident that a minimum amount of these bases is required building up egg proteins, and, if the supply is insufficient, the production of eggs t be limited according to the law of minimum.

As rabbits or rats can grow normally on a milk diet which is practically free n nuclear substances, there is no doubt that purine or pyrimidine bases can be ned from amino acids. The close resemblance of arginine and histidine to the ve-named bases suggests that the latter can easily be formed from the former, there is yet no direct proof to support this view; our animals would never grow nout a supply of these two bases. A point which remains to be determined is ther histidine could be replaced by arginine or not. Mention may be made here he fact that many hormones, such as tyramine, adrenaline and histamine are ved from tyrosine and histidine. Choline and betaine are also formed from no acids by methylation, so that the formation of nervous tissues is indirectly endent upon amino acids.

In the case of other amino acids than those mentioned above, it has not yet n proved whether they are essential or whether they can be replaced by others. ocoll is most probably not essential, while alanine and leucine can replace each r. Recently the importance of proline has been shown by B. Sure. Whether proline can replace proline remains still to be settled.

If we could obtain normal growth with a ration containing a mixture of amino s instead of protein, we should be able to determine the rôle of each amino acid e precisely, for we could observe the effect caused by eliminating any one of amino-acids from the mixture. This kind of experiment has, however, not yet n successfully performed by any worker.

We did some experiments of this kind some years ago, employing a mixture he following amino acids:

Glycocoll	4	Glutaminic acid . . .	15
Alanime	15	Phenylalanine	3
Leucine	20	Arginine	5
Valine	8	Histidine	5
Proline	5	Lysine	5
Cystine.	3	Tryptophane	2
Tyrosine	5	Ammonium carbonate.	2
Aspartic acid	3		
		Total.	100

(Note. — Glutaminic acid was given as the sodium salt during the first part of experiment, but later it was given as the calcium salt. Arginine, histidine and ne were employed in the form of the hydrochlorides.)

The above mixture was mixed with butter, starch and protein-free milk in the wing proportions: Amino-acids mixture 15, butter 20, starch 36, protein-free : 28, ca-lactate + ca-phosphore 1,

Albino rats weighing 52 to 100 grams were fed on the above ration. The ani had a good appetite at first but they did not grow at all; their body weight soon b to decline and their appetite was lost. One died in 50 days (Figure II). To an one which was about to die at the end of 47 days, horse-meat protein was given in of the amino-acid mixture; the animal soon recovered its appetite and bega grow vigorously.

This experiment proved that the amino-acid mixture could not replace pr in the diet. The animals, however, lived longer than those fed only on water or protein-free ration (Figure II).

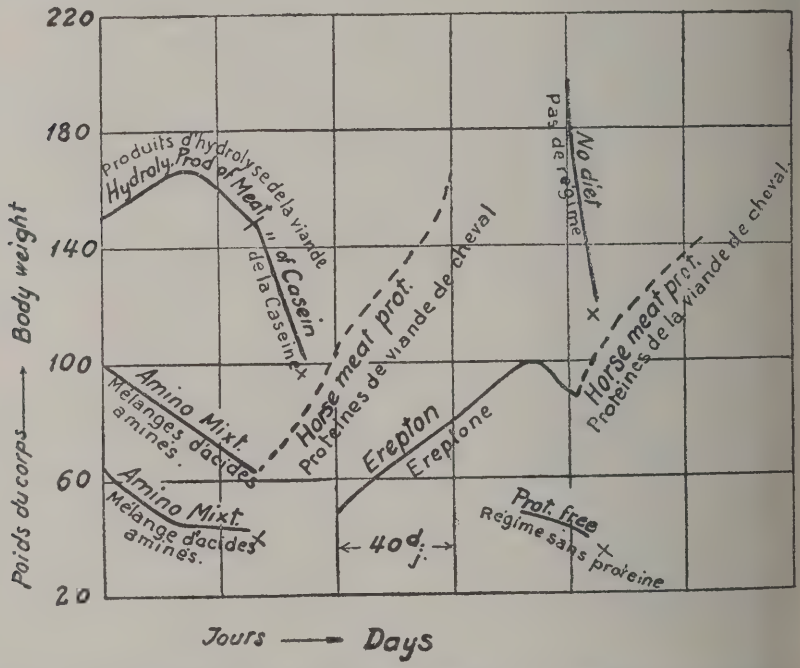


FIGURE II. — Experiments with hydrolytic products of proteins and with the m amino acids.

We then carried out experiments with hydrolytic products of proteins, us mixture of two preparations obtained as follows:

(1) Horse-meat protein was boiled with 25% sulphuric acid f hours and, after cooling, the sulphuric acid was carefully removed by b and filtered; the filtrate was decolorised with animal charcoal and e rated to dryness.

(2) Horse-meat protein was boiled with an excess of saturated b solution for 60 hours, when the solution no longer gave the biuret reac it was filtered and, after removal of the baryta by sulphuric acid, evapo to dryness.

The two preparations were mixed in equal proportions and sodium carb was added to neutralise the acidity. By boiling the meat with sulphuric tryptophane and a part of the cystine were decomposed; while by treating baryta, tryptophane was racemised, though it was not destroyed; cystine and a of the arginine were decomposed. The mixture of the two preparations thus tained all the amino acids except cystine, and we therefore added cystine

To this mixture were now added butter, starch and protein-free milk in the usual and this ration was given to albino rats. No good result was obtained, as is n in Figure II.

We have obtained good results with Witte's peptone and have also tried pton", a preparation imported from Germany.

Fed on a diet containing 15 per cent erepton, a rat lived more than 100 days ained in body weight, but growth was much slower than normal (Figure II). on is considered to be a mixture almost entirely composed of amino acids ontaining a variable quantity of peptides. Why, then, were good results not ned previously with the mixture of pure amino acids ? This might be due presence in protein of some very unstable substance, which plays an important n nutrition. Racemisation of amino acids by the action of acids or baryta also be a factor in producing the untoward effects. The real cause will be ed before long and then the problem of the preparation of an artificial diet e much simplified.

2. Nutritive Value of Proteins in Various Articles of Food.

Here we will deal with the nutritive value of proteins derived from foodstuffs neral use.

(1) *Fish Proteins.*

n Japan, fish are employed as food more extensively than in any other country, quently it is important for the Japanese to determine whether fish flesh ne same nutritive value as the flesh of chicken or cattle. At the same time, stablishment of its nutritive value would greatly influence our future food . With this object in view, we carried out feeding experiments some years and showed that fish proteins are as good as any other animal proteins. It be kept in mind, however, that fish flesh contains, besides proteins, many valuable constituents such as fats, glycogen, extractives, inorganic matters, ins, etc., which are indispensable for the nutrition of animals. Therefore, nparing fish with meat, these constituents should never be excluded from our leration. The present work has been carried out simply on proteins. There o need to separate and purify the proteins of fish or of meat in such practical iments as we carried out. The following procedure sufficed: the material was riturated and boiled with water; the coagulum formed was mixed with the ble residue and boiled twice or three times with a large amount of water. oiled residue was then extracted twice to three times with alcohol and ether. emaining substance was practically pure protein, which could be powdered desiccation. In the feeding experiments the proteins thus prepared were l with other substances in the proportions shown below and given to albino protein 10%, butter 14%, protein-free milk 28%, starch 48%.

Generally speaking, a ration containing 10 per cent of fresh protein was suffi- to promote normal growth in young albino rats. The experiment lasted for generations without producing any abnormal symptoms. We carried out r experiments with milk casein, beef, horse meat, etc., as controls, and proved ish proteins are no less nutritious than meat proteins. In another series of iments in which the protein was reduced to 7 per cent, the animals still attained al growth, although there were slight differences in development according e different kinds of fish from which the proteins were prepared; thus herring, n, dried bonito, ligament of the escallop-shell, crayfish, crab, etc., gave nearly me results as beef, while tunny, mackerel, shark, globe-fish, etc., gave more s inferior results (Figure III).

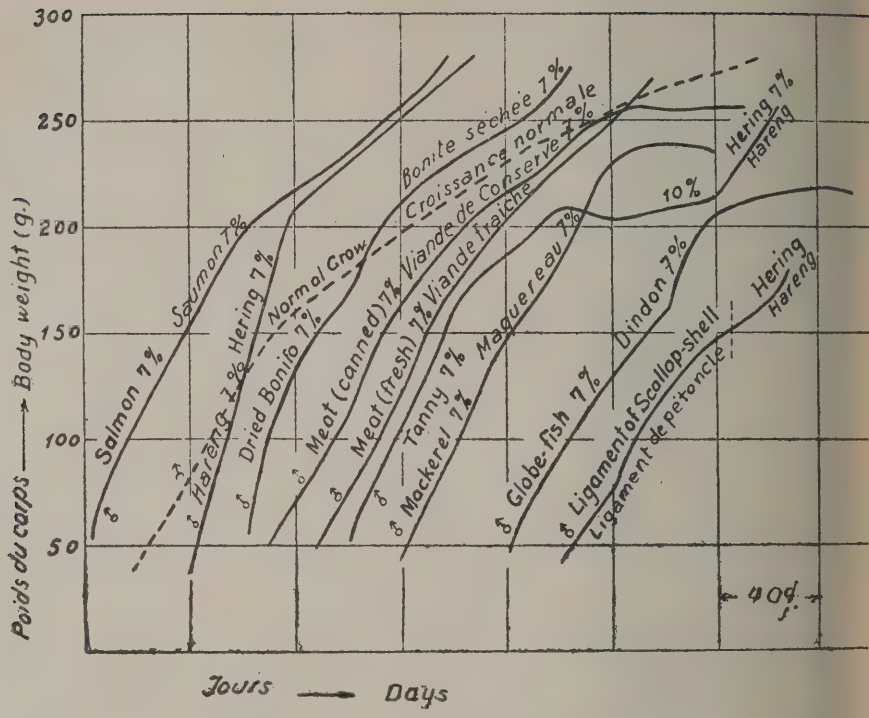


FIGURE III. — Fish proteins (7%).

For the sake of further comparison, the results of experiments with the pr
of peanut and soy-bean (whole grain) are shown in the following figure (Figu

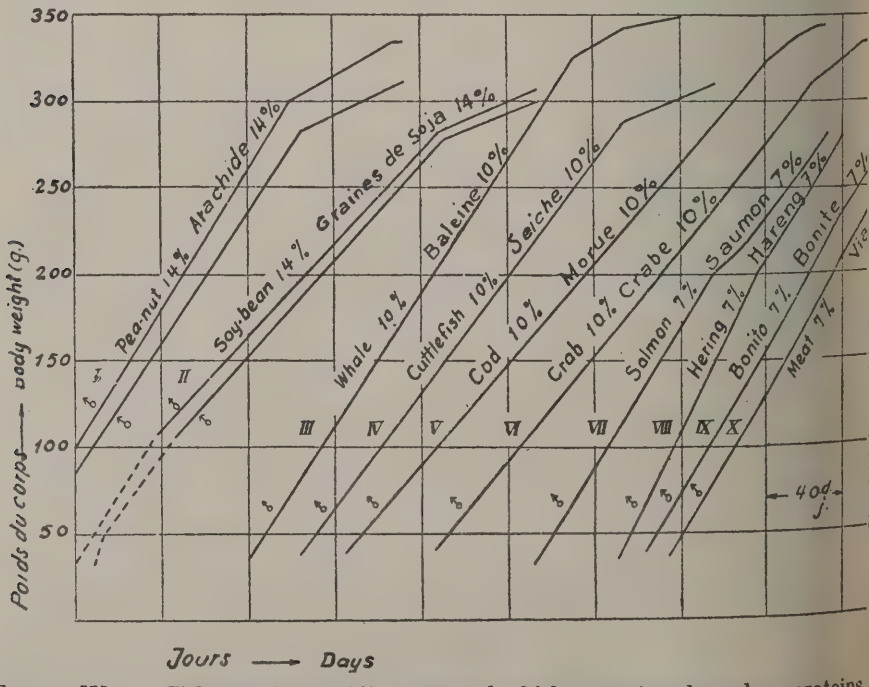


FIGURE IV. — Fish proteins (10%), compared whith peanut and soy-ban proteins

should be noticed that the market price of fish does not necessarily correspond eir nutritive value, for the cheaper fish, such as salmon, herring, etc., may higher nutritive value than the dearer. The nutritive value of various fish s seems to be closely related to their amino-acid content, especially to that ie. The ligament of the escallop-shell is especially rich in lysine.
ied fish had just the same nutritive value as fresh, and even canned fish r a long period had not lost any of its nutritive value as far as proteins were ed. Some 4- to 10-year-old canned beef was presented to us by the Depart- Provisions of the Japanese Army to be tested, and we could find no difference utritive value of the proteins derived from the fresh sample and those from served ones. The same was found with fresh and dried bonito.

(2) *Rice.*

rfectly polished and washed rice contains about 7 per cent of proteins, 92 t of starch, and a small amount of fat, fibre and ash.
lished rice contains the following amounts of the different types of protein:

Soluble in 10% sodium chloride	14.17 %
Soluble in 0.2% caustic soda solution . . .	70.90 %
Soluble in water	5.84 %
Soluble in 60% alcohol	9.17 %

" rice-koji " is extracted with a 10% sodium-chloride solution and the is dialysed at room temperature, hexagonal plane crystals separate out closely resemble the " excelsin " of brazil nut. Crystallisation takes place because substances such as dextrin, which prevent the crystallisation of pro- e dissolved and assimilated by fungi. Some of the proteins soluble in dilute belong to this group of crystalline proteins.
e rice protein used for our experiments was prepared as follows:
lished rice was finely powdered and mixed with a 0.2% caustic soda solution. he mixture had stood for several hours, during which time the mixture was nally stirred, it was filtered through cloth. A greyish-white precipitate formed ling dilute acetic acid to the filtrate: this was collected and washed with alcohol and ether successively. It was re-dissolved in a 0.2% caustic soda n and reprecipitated. By this process about 70 per cent of the rice protein e obtained. Amounts proportional to 10, 15 and 18 per cent of this protein ted as pure protein) were taken, butter and protein-free milk were added proportions of 18 and 28 per cent respectively and enough starch was added e up the total to 100. These three mixtures were administered to albino The results showed that rice protein was inferior to fish protein, because by the former to the extent of 10 per cent of the diet the rats never gained more 0 grams. By using 12 per cent of it a better result was obtained, but normal seemed only attainable by employing 15 per cent or more of this protein gure V).
mentioned above, rice contains a small amount of water- and alcohol-soluble s. If, therefore, these proteins were added to those employed in our pre- experiments, *i.e.*, if we were to use the whole protein of rice, a better result be expected. For this purpose we extracted the rice-flour with a 0.2% caustic olution and precipitated the greater part of te protein by adding dilute

acetic acid in slight excess. The filtrate therefrom was boiled to coagulate the remaining in solution (chiefly albumins); the coagulum was added to the first pitate; the starch adhering to the protein was removed by means of diasta the whole was again dissolved and precipitated in the way mentioned abov this process we could collect the greater part of the proteins, including the and alcohol-soluble ones.

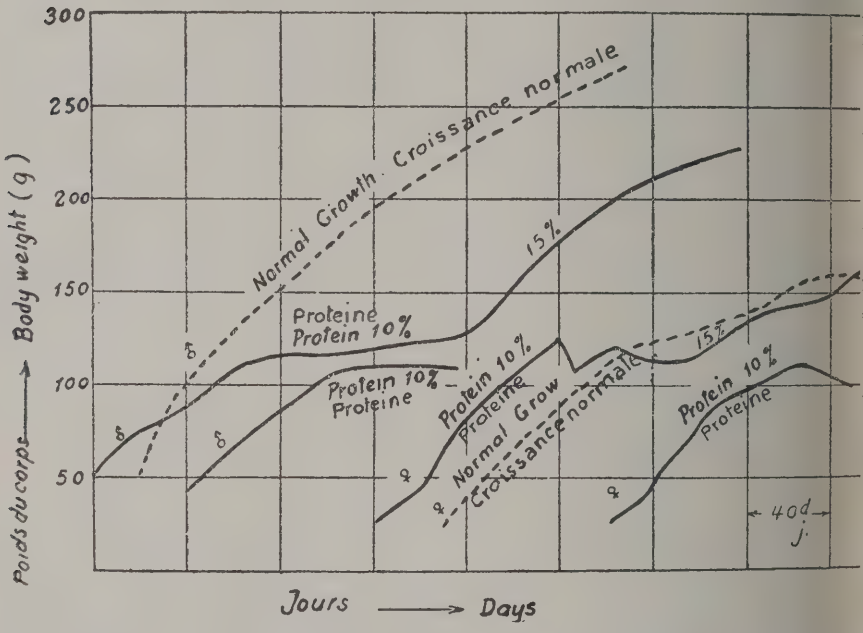


FIGURE V. — Experiments with rice protein extracted with dilute alkal

The diet for our feeding experiments was prepared by mixing together cent of rice-flour, 14 per cent of butter, 28 per cent of protein-free milk and cent of the proteins obtained in the manner above described.

This diet gave fairly good results, but it was still somewhat inferior to t that had contained 7 per cent of the proteins of salmon or herring, etc. (see VI). Protein prepared from unpolished rice instead of polished rice gave som better results because the bran and the embryo contain proteins of better than are found in polished rice.

It will be seen from Figure VII that the rats fed on a ration containing cent of rice protein gradually gained in body weight until they reached a ma of 300 grams, but with 10 per cent of protein they attained the same body only when 1 per cent of calcium carbonate was added to the diet; on the however, normal growth was not secured with 10 per cent of rice protein. One rats fed on a mixture containing tryptophane reached the weight of 377 the others, however, did not exceed 300 grams. Generally, the addition of tryptophane and cystine had some beneficial effect upon the growth, but the acid which controlled the growth in this case was probably lysine. These remain still to be examined in detail. We may conclude from these experi data that 10 per cent of rice protein is nearly equal or is a little inferior to 7 p of fish proteins (Figure VII).

en the rats were fed on a ration containing 2 per cent of beer-yeast besides nd protein-free milk, the amount of rice protein required for producing growth was 8.5 per cent. With 6.5 per cent of rice protein and 2 per cent of h or horse-meat protein, the rats also grew very well (Figure XI).

addition of a small amount of milk, meat, egg or fish protein gives decidedly sults than does the addition of more of the rice protein. We carried out a series iments to determine the minimum amount of various proteins required for ntenance of fully-grown albino rats. With meat, milk and fish proteins, minimum was found to be 5 to 6 per cent, while with rice protein it was per cent.

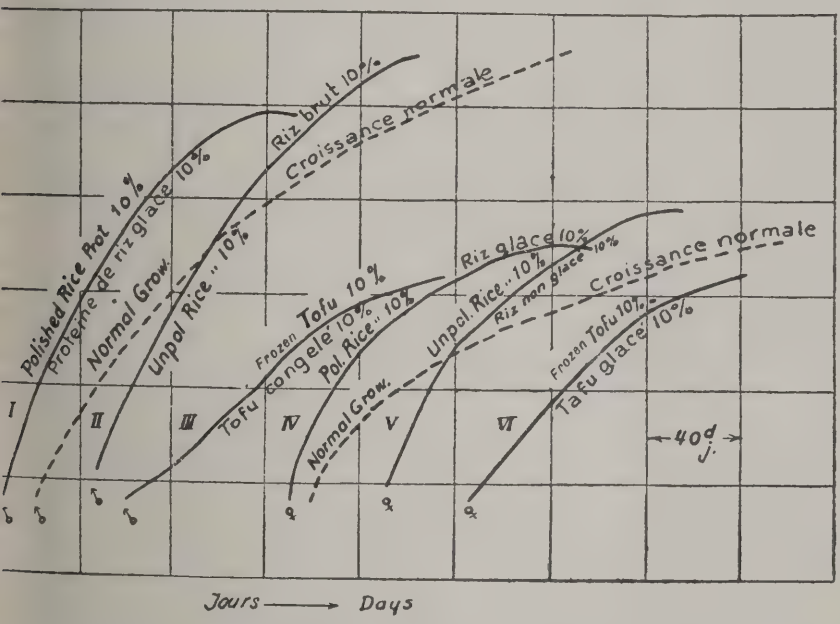


FIGURE VI. — Experiments with rice and tōfu proteins.

r mixed with protein-free milk and butter and supplemented with rice protein up to 10 per cent.

rice embryo is very small and is almost entirely removed during the process ing. It is rich in protein, fat, sugar and vitamins. M. Hamada analysed sample of rice embryos, the so-called "menzai", which was supplied by ıe" Rice-Polishing Factory. This sample contained approximately 70 to 80 of pure embryos. The results of his analysis were as follows:

	%
Crude protein	23.0
Protein	19.5
Fat	23.0
Fibre	11.1
Starch, sugar, etc.	30.9
Ash	11.4

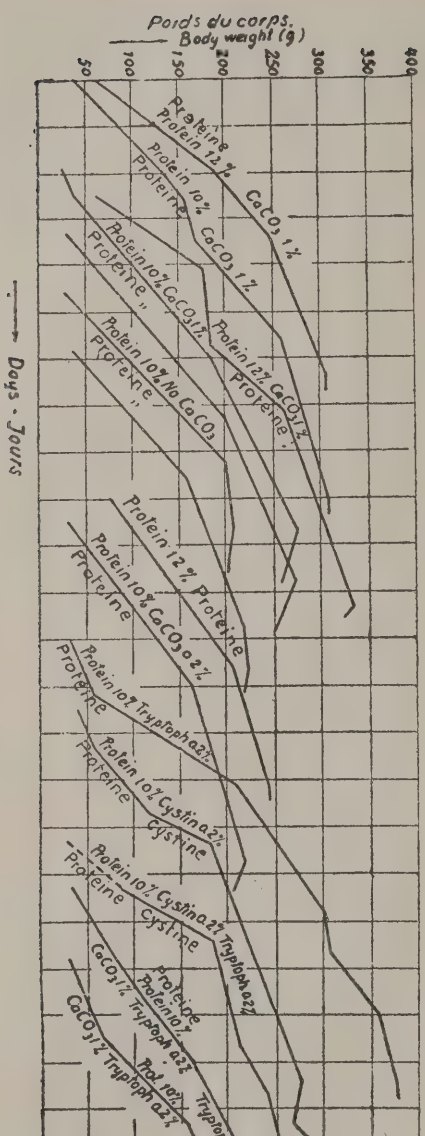


FIGURE VII. — Experiments with the whole protein of polished rice.

He isolated the protein from "r and estimated the amino nitrogen by lysis. The results were as follows:

Monoamino nitrogen . . .	54
Diamino nitrogen	36
Arginine nitrogen	20
Histidine nitrogen	5
Lysine nitrogen	9
Cystine nitrogen	0

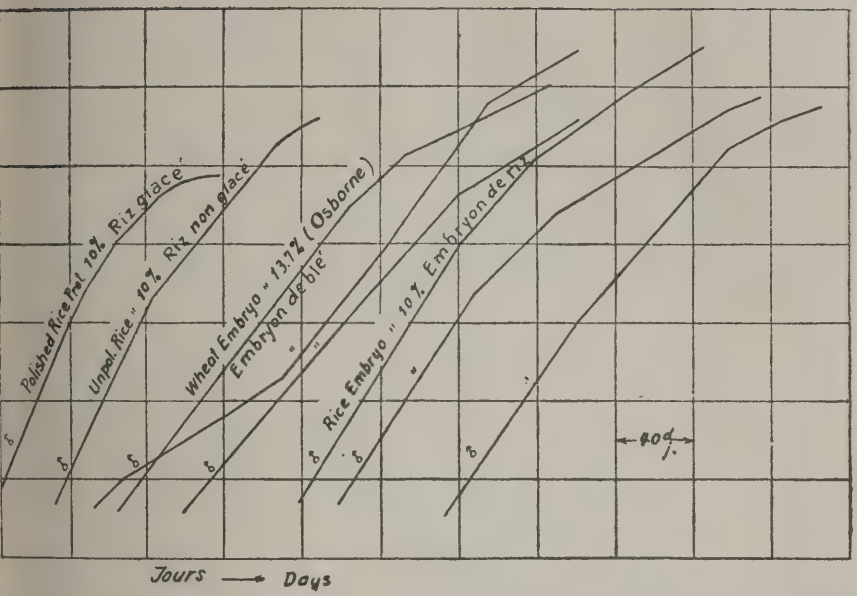
It will be seen that the embryo c nearly as much protein as does me lysine content was just twice as great of polished rice, so that a high nutritiv might be expected for the embryo Feeding experiments proved this to I If our results are compared with t Osborne obtained with wheat embryo it is seen that rice embryo protein i than wheat (Figure VIII).

(3) *Wheat.*

Wheat meal supplied for human co tion consists chiefly of the perisperm contains about 11 per cent of protei largest portion of this protein con alcohol-soluble gliadin and glutenin are commonly known by the name

The refined preparation of gluten suffice to promote growth in animals, wheat-flour protein. When given large amounts to rats only slow growth When, however, 2 per cent of meat is added to 6 per cent of the wheat tolerably good growth is attained. about one-third of the total protein in ration was replaced by either egg or milk or meat protein, more sati growth was attained. Ten per cent mixed proteins gave far better results per cent of the wheat protein alone.

In experiments carried out authors, animals fed with a ration co 7 per cent of gluten did not incr weight beyond 150 grams. When cent of diamino acids prepared fr semen of the salmon was added above ration, somewhat better was obtained. Good growth co obtained by giving a ration co 14 per cent of gluten and 0.7 per diamino acids, but growth stopped when the ration was changed to 7 per gluten without any admixture of the semen preparation. The chief cause


Polished Rice Rat 10% Riz glacé
Unpol. Rice " 10% Riz non glacé
Wheat Embryo " 13.7% (Osborne)
Embryon de blé
Rice Embryo " 10% Embryon de riz
40 J.
Jours —→ Days

: VIII. — Rice embryo protein compared with wheat embryo and rice protein.

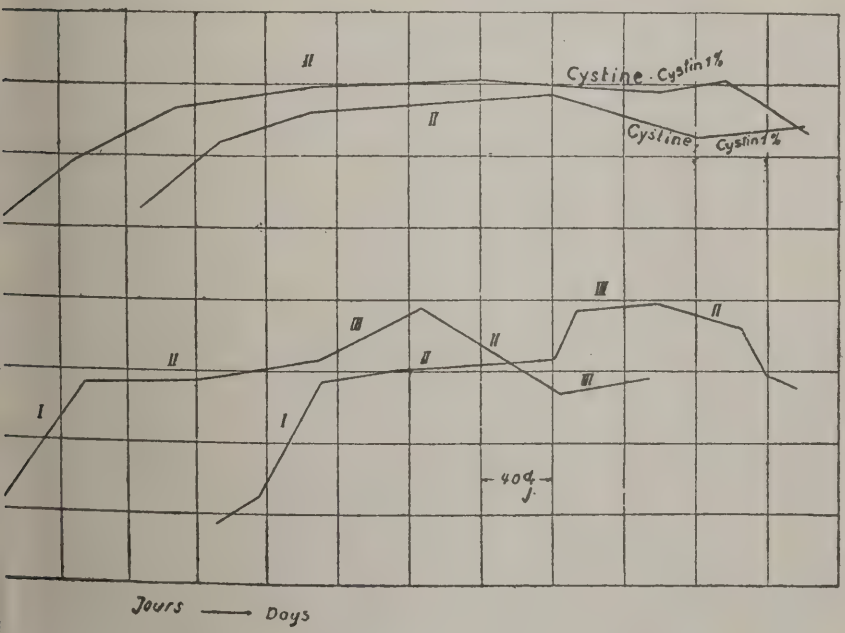


FIGURE IX. — Experiments with wheat gluten.

en	13.3%				
ino acids	0.7%				
er . . .	14.0%	II	Gluten 7%	III	Gluten . . . 6.6 %
h . . .	44.0%		Butter 14%		Diamino acids 0.35%
-free milk	28.0%		Starch 51%		Butter . . . 14.0 %
			Prot.-free milk . 28%		Starch . . . 51.0 %
					Prot.-free milk 28.0 %

low nutritive value of gluen has been proved to be its remarkably low c of lysine and tryptophane (Figure IX).

From the whole grain of wheat a better mixture of proteins is obtaine from wheat-flour, *i.e.*, the nutritive value of the former is found to be highe that of the latter. Proteins from the whole-wheat grain would serve as a tenance ration as well as casein does and, if given in sufficient quantity, coul duce normal growth (see Figure X).

It should be noticed here that in America there is a movement to mal public use wheat-flour from which as little bran as possible has been rem just as there is a movement in Japan to encourage the use of either unp rice or half-polished rice. From the point of view of the economical use of pr

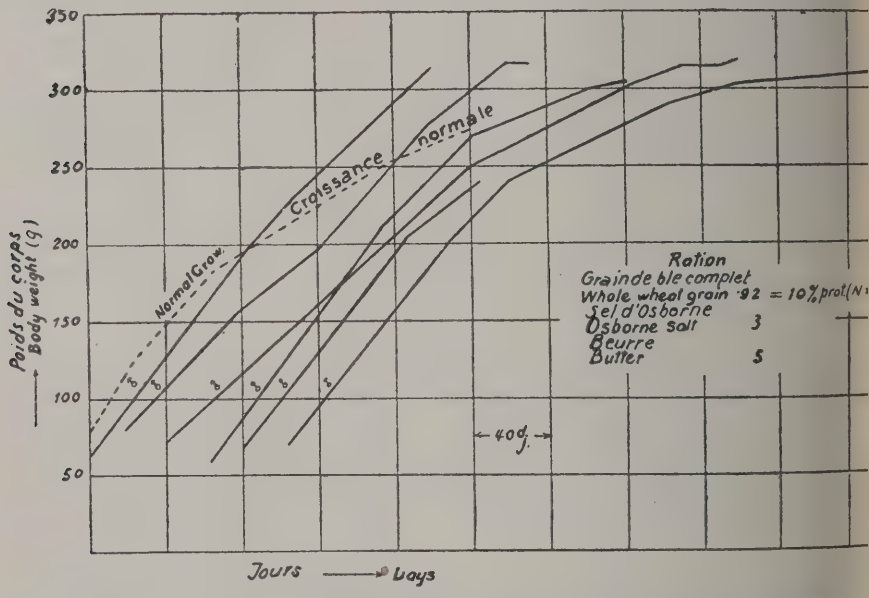
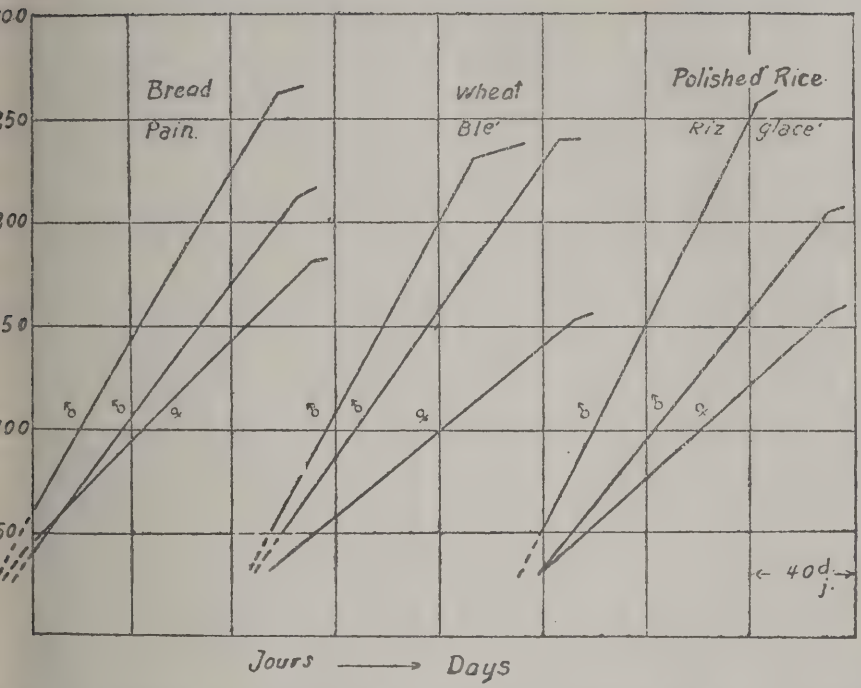


FIGURE X. — Experiments with whole-wheat protein (after Osborne).

these movements are rather irrational, because the admixture of only a small a of meat or milk gives better results. Bran should be fed to domestic anima the milk or meat from them should be used for human food. Bran conta fat-soluble vitamin, although it is rich in water-soluble vitamin, and therefo advisable to keep it for cattle and give milk and meat to man. In the case a further point must be considered; when perfectly polished, it is entirel from any water-soluble vitamin, and its use would lead to a dangerous B-avitam the use of half-polished rice could, however, be safely recommended. The half-polished rice may promote the utilisation of certain inorganic subs but it is of no great importance from the point of view of the utilisation of pr

The authors fed young albino rats with a ration consisting of bread to had been added 2 per cent of beer-yeast, 10 per cent of butter, 18 per cent of Os salts, and 0.2 per cent of calcium carbonate, with sufficient starch to make protein content of 10 per cent. With this ration the rats attained just the st growth. It was also found that a ration containing 6.5 per cent of either wheat or rice protein and 2 per cent of meat protein was adequate for to good growth (Figure XI).



: XI. — Showing the good growth of rats by supplementing 2% of meat protein) the diets, containing each 6.5% of bread, wheat and polished rice protein.

(4) *Soy Bean.*

he chief protein contained in the bean is glycinin, which is soluble in dilute . The protein found in " tofu " (bean curd) consists almost exclusively of ort of protein; Besides this the bean contains a small amount of water- e and alcohol-soluble protein.

he amount of diamino nitrogen in the bean protein is as follows:
lycinin 3.95 %, " tofu " protein 4.65 %, frozen " tofu " protein 4.47 %.
he distribution of diamino nitrogen expressed as a percentage of the total en of the bean protein is as follows:

Table III.

	Arginine nitrogen	Histidine nitrogen	Lysine nitrogen	Analyser
n protein (whole grain) .	62(?)	2.60	7.02	Grindley
ite bean (whole grain) .	12.67	5.77	6.14	Grindley
ofu " protein	13.09	6.87	9.03	Kimura
zen " tofu " protein . .	15.85	3.66	8.38	Kimura
cinin.	14.18	3.26	3.72	Grindley
cinin.	15.30	2.38	10.27	Jones and Waterman

The figure for the lysine nitrogen of glycinin obtained by Grindley seems too low. Perhaps that of Johns and Waterman is more reliable.

The lysine content of bean protein lies between that of rice and meat pr and is much greater than that of wheat or other vegetable proteins. The nu value of bean protein seems, therefore, to be high. Osborne carried out fe experiments with the raw, boiled and steamed bean as well as with bean In the case of the raw bean, growth was much slower than in the case of the c bean.

The bean contains more or less fat soluble vitamin and the rats eating it well even when no butter was added, though the addition of butter produced satisfactory growth. The authors showed that the bean oil, unlike other plan contained a comparatively large amount of fat-soluble vitamin.

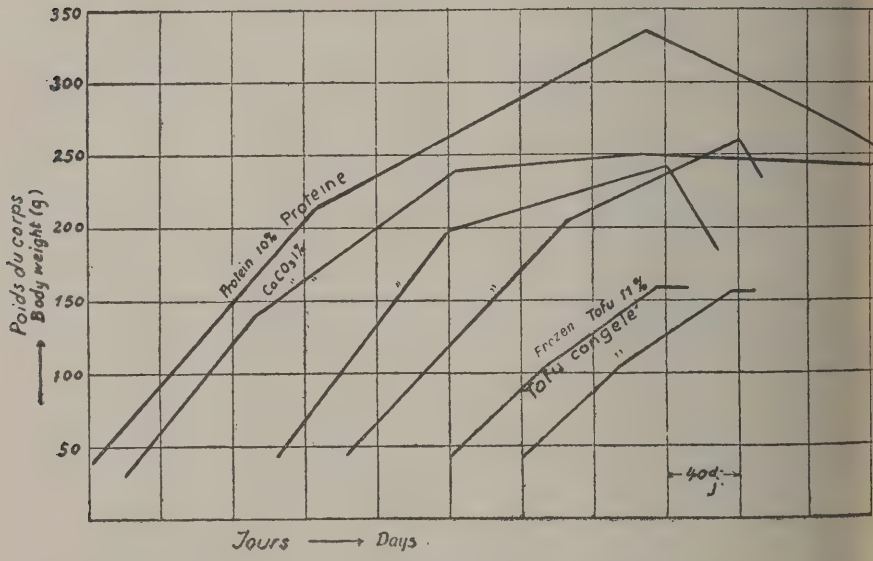
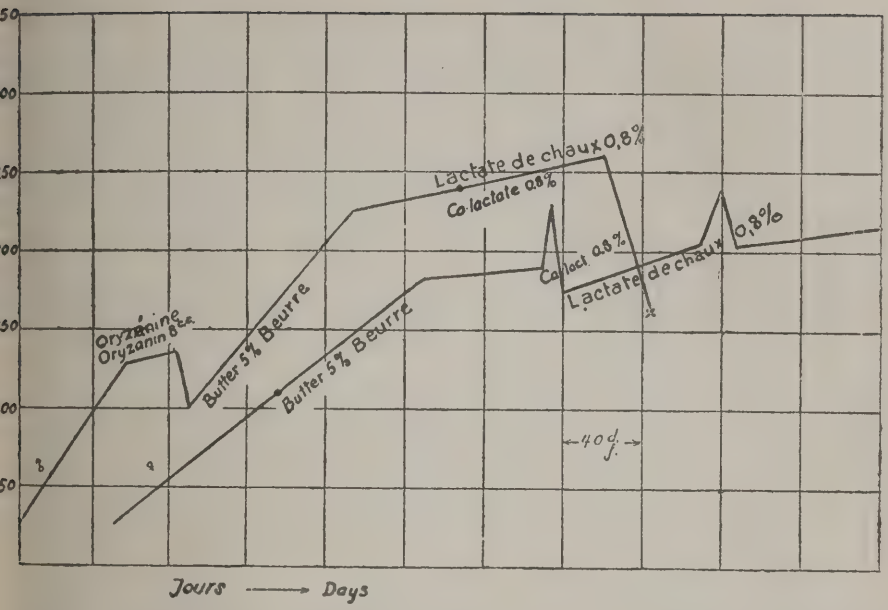


FIGURE XII. — Experiments with "tōfu" protein

M. Koyama carried out feeding experiments in the author's laboratory ration consisting of fat-free bean-flour, butter, starch and protein-free mil protein content of the mixture was 14 per cent and was sufficient for normal (see Figure IV, comparison with fish proteins.)

" Tofu " has a somewhat lower nutritive value than the whole bean bec does not contain the water-soluble protein of the bean. The authors dried " reduced it to a powder, removed the fat and added butter, starch and p free milk so that the total mixture contained 10 per cent of protein; the of the feeding experiments with this ration are shown in Figure XII.

The authors fed albino rats with the following mixture: polished rice cent, " tofu " 17 per cent, Osborne's salts 2.8 per cent, calcium carbonate cent and a small amount of oryzanin, making the total protein content of the r 10 per cent. It did not give satisfactory results; the rats did not exceed 130 in weight. When 5 per cent of butter was added to the ration, they began t vigorously. This means that the protein was not inadequate but the ration



RE XIII. — Showing the moderately good growth with the ration consisting of 80% polished rice and 17% tofu, when 5% butter was added to it.

proper amount of fat-soluble vitamin (see Figure XIII). It should be pointed that " tofu " contains a large amount of magnesium, so that the growth of the nals would be markedly interrupted unless a suitable amount of calcium was ed to the ration.

(5). *Kaoliang (Andropogon sorghum Brot).*

J. Kimura analysed kaoliang seedwith the following results:

	Polished kaoliang	
	% of air-dried substance	% of dry substance
Water	9.23	—
Crude fibre	1.32	1.43
Crude fat	2.08	2.29
Non-nitrogenous substance	78.12	83.86
Crude protein	10.19	11.23
Ash	1.05	1.16
Total nitrogen	1.63	1.80
Protein nitrogen	1.60	1.76
Non-protein nitrogen	0.03	0.04

Almost all of the nitrogen is in the form of protein, the total amount of latter being almost equal to that of wheat. Although there are variations accor to the varieties and to the degree of polishing, kaoliang protein contains, on average, 4.4 per cent of water-soluble protein, 1.67 per cent of protein solubl 10% sodium chloride, 59.4 per cent of protein soluble in a 0.2% caustic soda solu and 34.6 per cent of other protein. When kaoliang is extracted with 70% alc at 70° C, 48.3 per cent of the total protein is dissolved, *i.e.*, nearly one-half of protein belongs to the prolamin group as does gluten obtained from wheat; mos the rest is alkali-soluble. Johns and Jones gave the name " kafirin " to the alc soluble protein of kafir.

Kimura hydrolysed kaoliang protein by hydrochloric acid and determined distribution of nitrogen by Van Slyke's method; he obtained the following res

	Alcohol-soluble protein (% of total nitrogen)	Whole kaolian protein (% of total nitrogen)
Humin nitrogen	0.28	1.05
Ammonia nitrogen	21.28	16.05
Histidine nitrogen	3.67	2.39
Arginine nitrogen.	4.26	5.02
Lysine nitrogen	4.53	2.96
Cystine nitrogen	0.14	0.11
Monoamino nitrogen	64.86	63.78

We have calculated from the above results that, for every 100 parts of alc soluble protein, there is 1 part of arginine, 1 part of histidine and 3.4 parts of ly Johns and Jones analysed " kafirin " and found: arginine 1.6 per cent, histidin per cent and lysine 1.9 per cent. The lysine content obtained by them seems too small.

Kimura fed albino rats with a ration consisting of the following mix polished kaoliang 92.4, butter 14.2, Osborne's salts 2.8 and calcium chloride The mixture contained 9.5 per cent of protein, 14 per cent of fat, 72.5 per ce carbohydrate and 4 per cent of ash. The rats grew very slowly and did not e 150 grams in body weight; the addition of 1 per cent of diamino acids prepared horse meat, together with a small amount of cystine and tryptophane, cau sudden increase in body weight. By removing the additional substances fro ration, growth was again retarded (see Figure XIV).

As will be seen from the analytical results, the amounts of arginine, hist and lysine in kaoliang protein are very small, which explains why kaoliang is i quate for the normal growth of rats. The amount of cystine is also insufficient f growth of rats; this was shown by the bad development of their hair. By add certain amount of cystine, the growth and lustre of the hair were greatly impr Thus the nutritive value of kaoliang protein seems to lie just between that of and rice.

It must be mentioned that kaoliang is almost entirely lacking in fat an soluble vitamin, although it seems to contain more or less water-soluble vit considering that the addition f ocryzanin caused better growth, it might be sup that the amount of the latter was inadequate (see Figure IV No. 1). The ad of calcium to the ration produced a better result.

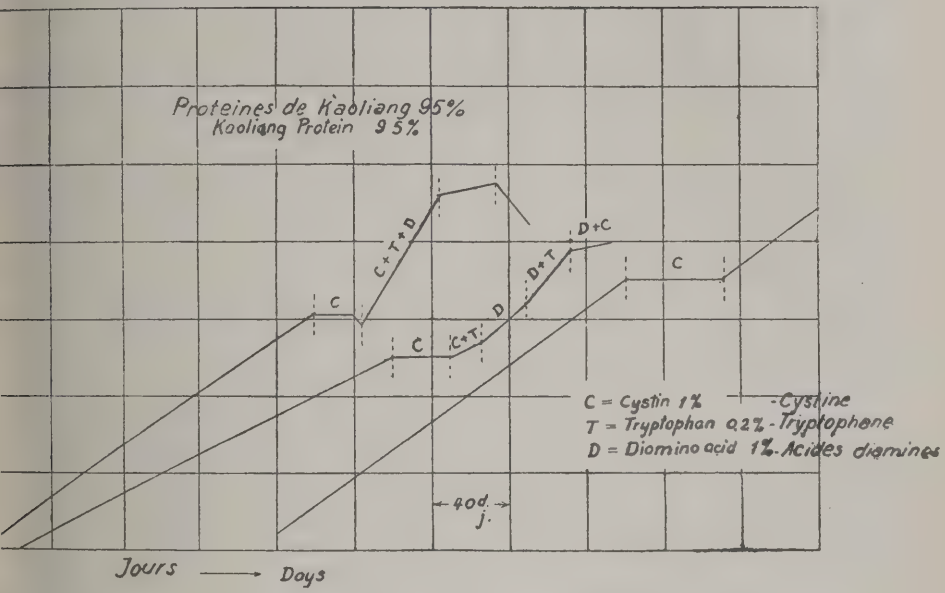


FIGURE XIV. — Kaoliang protein (Kimura.)

(6) *Oats.*

The authors carried out experiments with oatmeal such as is used for human
mption; the rations were as follows:

Table IV.

	1 (Protein 10%)	2 (Protein 8%)	3 (Protein 5%)
atmeal	70.0	57.0	35.5
sborne's salts	3.0	3.0	3.0
tter	5.0	5.0	5.0
arch	22.0	35.0	56.5

The rats fed on rations 1 and 2, containing 10 per cent and 8 per cent of protein
ctively, attained almost standard growth, but those taking ration 3 containing
cent of protein grew very slowly. It appears that the nutritive value of oats
arly equal to that of barley. They contain a sufficiency of vitamin B, but are
ient in calcium, and therefore the addition of a small amount of the latter
d give a better result.

7. *Rye.*

Using the flour of whole-rye grain, the following rations were prepared:

Table V.

	1 (Protein 10%)	2 (Protein 8%)	3 (Protein 5%
Rye flour	80.0	64.0	40.0
Osborne's salts	3.0	3.0	3.0
Butter	5.0	5.0	5.0
Starch	12.0	28.0	52.0

Rats fed on ration 1 seldom reached the weight of 200 grams, and most of t died in four to five months. Of those taking ration 2, some reached 200 grams most of them died. The results with ration 3 were almost the same as those barley and oats, but with the former there was a higher mortality. These results have been due to deficiency either of calcium or of water-soluble vitamin. Fu investigations must be made on this point.

8. *Peanut.*

The dried peanut, analysed by T. Shiba in the author's laboratory, had following composition in 100 parts of dry matter:

Crude proteins 32.18, crude fat 47.66, crude fibre 4.60, nitrogen-free extract 1 crude ash 4.20, total nitrogen 5.15.

In 100 parts of peanut protein there were 6.9 parts soluble in water, 64.6 soluble in 10 per cent sodium chloride, 24.9 parts soluble in dilute alkali, 0.9 soluble in alcohol and 4.8 parts in the residue.

Of the total proteins, more than two-thirds are soluble in 10 per cent so chloride. Taking advantage of the difference of their solubilities, they may be rated into arachin and conarchin. Johns and Jones analysed the peanut pro and their results are given in the first two columns of the following table; i third column are the results of T. Shiba (total protein nitrogen = 100).

	Arachin	Conarachin	Total prot of peanu (by T. Shi
Amido nitrogen	11.81	11.08	—
Cystine nitrogen	0.74	0.75	0.90
Histidine nitrogen	2.78	2.72	5.04
Monoamino nitrogen	53.30	50.23	—
Humin nitrogen	1.00	0.78	—
Arginine nitrogen	23.77	25.78	25.29
Lysine nitrogen	5.22	6.35	4.15
Non-amino nitrogen	1.65	1.94	—

We see from the above table that peanut protein is especially rich in arg histidine and lysine are also found in fairly large quantities. Shiba prepared free powder from peanuts and mixed it with butter, protein-free milk and in the following proportions: protein 14 per cent, butter 14 per cent, protei

3 per cent and carbohydrates 44 per cent. Two albino rats were fed on this ration months and grew at a normal rate reaching 320 grams (see Figure IV). It oticed that, even with a smaller amount of the protein, standard growth be expected; peanut protein seems therefore to be better than rice protein. s, however, contain no vitamin A, though vitamin B is present in small amounts.

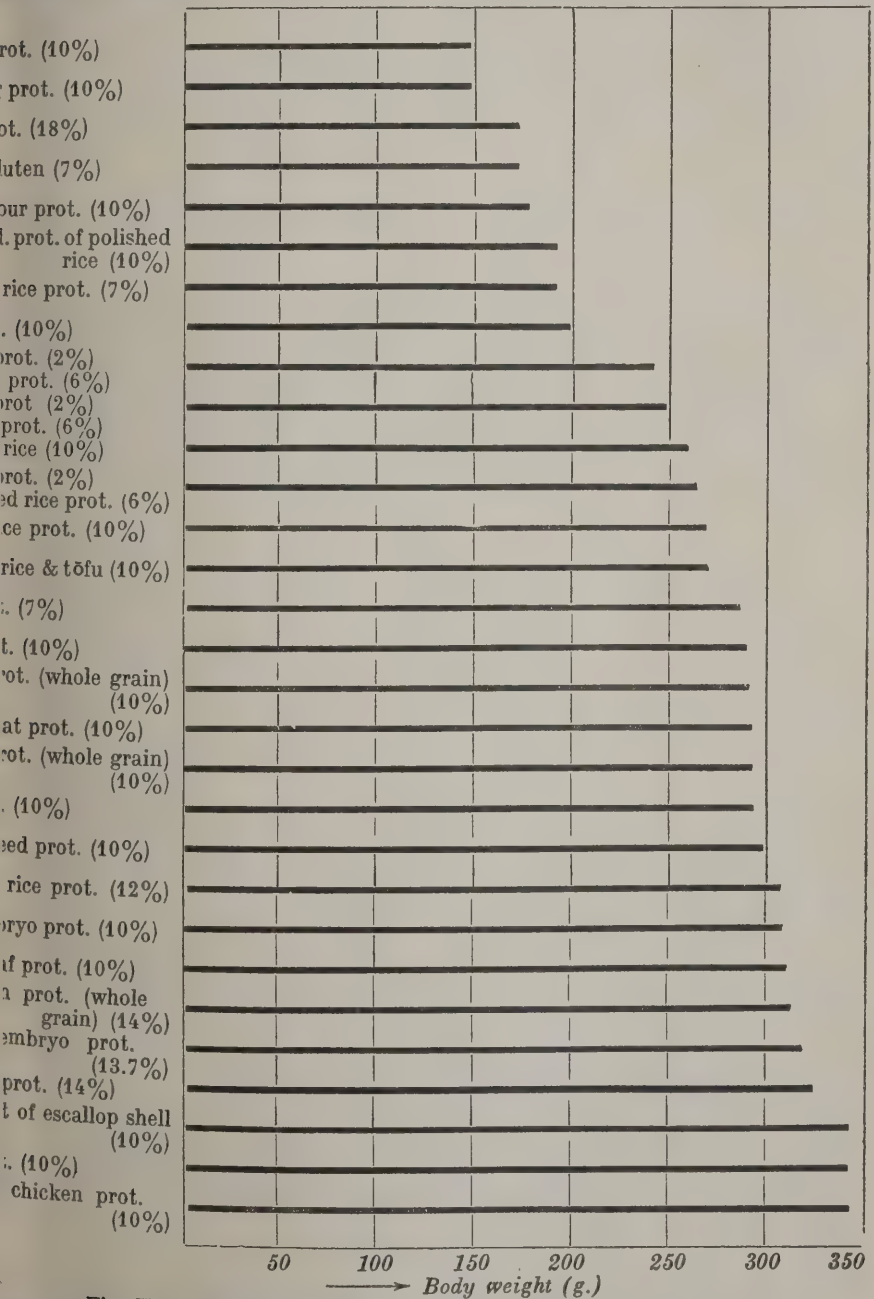


Fig. XV. — Relative Nutritive Value of Various Proteins.
Showing the maximum body weight attained by albino rats, fed on rations containing different proteins, the other factors being exactly the same.

Indian corn, barley, cotton seed, banana, potato, green leaves, etc., have examined by Osborne, Mendel and others with regard to their chemical compo and the nutritive value of their proteins.

Figure XV has been prepared to show clearly the comparative nutritive of various kinds of protein described above. The development of anim influenced by various other factors than mere nutriment, for instance, indiv differences, atmospheric temperature, diseases, etc., and therefore the dia probably requires certain corrections which could only be made by repeatin experiments under identical conditions. Only a general idea of the compa nutritive value of the proteins is therefore obtained from the diagram.

3. The Nutritive Value of Proteins and Its Relation to the Amino-Acid Content.

The authors tried to find out the relation between the nutritive value of v proteins and their amino-acid content from the results already obtained their experiments. At present it is almost impossible, owing to the difficu estimating all the amino acids quantitatively. The estimation of diamino *i.e.*, of arginine, histidine and lysine, can, however, be made with comparative acc so we shall confine ourselves to the consideration of these three amino acids. following table shows the distribution of the total diamino nitrogen in various of protein:

Rice protein	17.69	5.39	4.90	(Osborne).
Polished-rice protein	17.21	6.25	3.70	(Kurosawa).
Rice-bran protein	18.05	5.85	5.41	(Kurosawa).
Wheat	7.99	1.67	2.47	(Grindley).
Wheat	12.53	3.84	4.04	(Grindley).
Hordenin (barley)	7.61	5.57	0.51	(Grindley).
Gliadin (wheat)	5.71	5.20	0.76	(Grindley).
Barley	9.46	3.64	2.19	(Grindley).
Arachin (peanut protein) . . .	23.77	2.78	5.22	(Johns, Jones)
Globulin	8.34	4.23	2.80	(Johns, Jones)

The figures shown above may not all be very accurate, but all of them been obtained by the most recent methods and we believe that the errors a great.

It will be seen that fish proteins generally contain about the same ar of diamino acids as those of beef, chicken, etc. The proteins of polished ric bran, tofu, frozen tofu, etc., contain nearly the same amounts of diamino a fish proteins, while zein, hordenin, gliadin, etc., are exceedingly poor in them, fact coincides with their low nutritive value.

The lysine content seems to bear a still closer relation to the nutritive than the total diamino-acid content. Animal proteins are generally very lysine, which represents about 10 per cent of their total nitrogen, while rice contains about one-half of this amount. Far smaller quantities of lysine are in barley and wheat proteins.

Although various methods have been proposed for the quantitative dete tion of tryptophane in the protein molecule, none of them is generally accep reliable. Matsuyama and Mori, in our laboratory, modified the Rose-H method and found it to be tolerably accurate in the case of different proteins. method is as follows:

1 g. of the sample is put into an Erlenmeyer flask, 20 c.c. of 0.2% caustic lution are added and the mixture is warmed on the water bath at 40 to 50° C.; he sample is completely dissolved the solution is cooled and 100 c.c. HCl (1 : 1) .c. Ehrlich's reagent (5 g. p.-dimethylamino-benzaldehyde dissolved in 100 c.c. sulphuric acid) are added to it and the whole is kept for 24 hours at 35° C. en for 24 to 40 hours at room temperature. The blue colour developed is red in a Dubosque's colorimeter with that of a standard solution prepared ating pure casein exactly in the same way as above. The tryptohane content e casein is taken to be 1.5 per cent.

ne results obtained with more than 20 different proteins are as follows:

ucin	—	0	0
elatine	0	0	0
obulin	—	1.62	1.52
y-bean protein	—	0.82	—
ice protein	—	1.33	—
rn protein	—	trace	—
aoliang protein	—	—	0.40
destin	1.40	1.40	1.40
gumin	1.05	0.94	0.67
nglutin	—	1.45	1.28
aseolin	0.80	—	—
uten (wheat)	—	1.00	0.95
uten (corn)	1.08	—	—
in	0	0	0
ckwheat protein	—	0.68	0.83
ne-seed protein	—	0	trace
iadin	1.14	—	—
utenin	1.68	—	—
ycinin	1.65	—	—
sein	1.50	1.50	1.50

e see from these results that vegetable proteins contain generally less tryp- than animal proteins, but there are many exceptions, so that the nutritive loes not always go in parallel with this amino acid.

should be kept in mind, however, that many other amino acids, such as , proline, etc., are equally indispensable for the nutrition of animals and that new amino acids have been discovered in recent times, which would certainly ted to nutrition.

ecently, the investigations of Sadikow and Zelinsky, Troensegaard, Shibata hers have thrown doubt upon the existence of amino acids in the peptide the protein molecule. We may perhaps in the future be compelled to modify esent conception of the constitution of proteins and we shall then have to the whole problem of nutrition in the light of our new knowledge.

16.

CHEMICAL PROPERTIES AND NUTRITIVE UE OF THE PROTEIN OF ITALIAN MILLET

(Setaria italica, KTH).

By Mitsuyuki Kondo

(From the Imperial State Institute of Nutrition, Tokyo).

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ur country Italian millet is an important cereal ranking next to rice and In spite of this fact, I can find no reports of any detailed investigation of erties and nutritive value of its protein. I therefore undertook the following nts.

material used for these experiments was Italian millet seed, which was by the polishing machine of the Institute and then powdered.

lysis of its constituents gave the following results:

	Percentages in air-dried matter	Percentages in dry matter
sture	13.57	—
le protein	11.12	12.87
tein	10.36	11.98
le fat	5.32	6.16
ogen-free extract	63.78	73.79
le fibre	1.71	2.01
le ash	0.87	1.01

1. Solubility of Proteins.

uration of proteins. — Before separating the proteins, their solubility in solvents was examined. As solvents, distilled water, 10% saline solution, saline solution, and 70% alcohol were used. The procedure was as follows: gr. of the sample were agitated with about 800 cc. of distilled water for 24 room temperature. After filtering and washing, the filtrate was made up . The residue was treated with 10% saline solution, 0.2% alkali solution

and 70% alcohol successively in the same way. The albuminous nitro determined in each of the four filtrates.

	Dry matter %	Total Nit %
Total N	1.98	100.0
Water soluble N	0.37	21.8
10% saline solution soluble N	0.43	25.4
0.2% alkali solution soluble N . . .	0.52	30.1
70% alcohol solution soluble N . . .	0.96	56.2

I repeated the extractions at a higher temperature, using the same but applying them directly to fresh samples, and obtained the following

Sample (gr.)	Total Nitrogen (gr.)	Solvent (200 c.c.)	Temp.	Time (hours)	Nitrogen extracted (gr.)
3.06	0.0544	Water	40° C	5	0.0228
2.64	0.0469	10% saline solution	40° C	5	0.0114
3.81	0.0678	0.2% alkali solution	40° C	5	0.0275
2.32	0.0413	70% alcohol solution	60° C	5	0.0209

It is evident that the proteins of Italian millet consist mainly of 70% soluble protein and 0.2% alkali-soluble protein; the author proceeded to these two proteins.

2. The Separation of the Alcohol-soluble Protein.

300 gr. of the sample were heated with five times their weight of 70% in a triple-necked flask, agitated for 6 hours at 60° C. and immediately filt yellow filtrate was obtained which was concentrated in vacuo, the greate the alcohol being thus removed. The residue was poured into cold water; th was precipitated as a yellow viscous mass. After filtering, the precipitate wa with water, dried, powdered and washed with ether; 18 gr. of nearly pure were obtained.

3. The Separation of Alkali-soluble Protein.

350 gr. of the sample were mixed with four litres of 0.2% NaOH solution for five hours at room temperature and allowed to stand for a few hours. The was then passed trough a centrifuge and the supernatant fluid was rem neutralised with acetic acid. The precipitate thus formed was filtered a dissolved in an alkali solution and the above treatment was repeated. After with water, alcohol and ether and drying, 20 gr. of protein were obtained

TROGEN DISTRIBUTION IN ITALIAN MILLET AND IN THE ALKALI-SOLUBLE PROTEIN AND ALCOHOL-SOLUBLE PROTEIN OBTAINED FROM IT.

(1) *The Nitrogen Distribution in Italian Millet.*

nitrogen distribution among the seven groups of amino acids was deter-rectly by the Van Slyke method with the following results:

	Dry matter %	Total nitrogen %
al N	2.033	100.00
20% HCl soluble N	1.958	96.29
20% HCl insoluble N	0.075	3.71
nin N	0.052	2.54
ide N	0.244	12.03
sphotungstate N	0.605	29.78
tine N	0.045	2.21
inine N	0.197	9.71
tidine N	0.240	11.81
ine N	0.123	6.05
ino N	0.508	25.02
-amino N	0.097	4.76
o-amino N	1.003	49.43

(2) *The Nitrogen Distribution in the Alkali-soluble Protein.*

method used was the same as in the previous analysis. The nitrogen ion was as follows:

	Dry matter %	Total nitrogen %
al N	10.020	100.00
20% HCl soluble N	5.981	59.69
20% HCl insoluble N	4.039	40.31
nin N	0.555	5.54
ide N	1.162	11.60
sphotungstate N	2.373	23.68
tine N	0.188	1.88
inine N	0.703	7.02
tidine N	0.944	9.42
ine N	0.537	5.36
ino N	1.794	17.90
-amino N	0.579	5.78
o-amino	5.316	53.05

(3) *The Nitrogen Distribution in the Alcohol-soluble Protein.*

	Dry matter %	Total ni %
Total N	13.120	100.
Hot 20% HCl soluble N	12.372	94.
Hot 20% HCl insoluble N	0.748	5.
Humin N	1.452	11.
Amide N	2.354	17.
Phosphotungstate N	1.846	17.
Cystine N	0.218	1.
Arginine N	0.664	5.
Histidine N	0.749	5.
Lysine N	0.615	4.
Amino N	1.249	9.
Non-amino N	0.997	7.
Mono-amino N	6.879	52.

It is seen that Italian millet protein is rich in hexone base nitrogen and an adequate quantity of lysine nitrogen; it appears therefore to be of great value.

Feeding Experiments to determine the Nutritive Value of this Protein.

(1) *Preparation of the Ration.*

Millet flour was the sole source of protein in the ration and the other components were added to it. The diet contained starch, butter (which source of vitamin A), Nelson's salt-mixture and, as a source of vitamin quantity of " oryzanine powder ". The proportions of the constituen ration were as follows:

Protein	10
Fat	14
Ash	4
Carbohydrate	72

The actual ration was made up as follows:

Italian millet powder	100 gr.
Butter	12 »
Nelson's salt-mixture	4 »
Starch	10 »

This mixture was heated with four times its weight of water on a until dextrinised.

(2) *The Course of the Feeding Experiments.*

ve male and five female albino rats were given this diet from December 3rd, o August 7th, 1924.

is ration containing 10 per cent protein was sufficient to maintain normal in the rats, though there were some decreases of body weight during the The average initial body weight of the young male rats was 58 gr., and this ed to 306 gr.; the young female rats increased from an average initial weight r. to 253 gr.

otwithstanding the fact that this protein is of vegetable origin, it proves to y favourable for growth.

17.

TUDIES ON THE PROTEIN OF BUCKWHEAT
(Jagopyrum esculentum moench.)
AND ITS NUTRITIVE VALUE.

By Minoru Hara

(From the Imperial State Institute for Nutrition, Tokyo).

ıvestigations concerning the chemical properties and nutritive value of buck- proteins have been carried out by various workers such as Ritthauser (1872), mura (1916), Johns and Chernoff (1918), Sawamura (1920), Kiesel (1922), and yama (1923).

y means of their varying solubilities in different solvents, buckwheat proteins e separated into fractions. The nutritive value of that fraction of the protein ıted by extraction with aqueous alkali has been examined by feeding it to white rats. The experiments lasted from November 1922 to December 1924.

Experimental Procedure.

amples of buckwheat flour were carefully prepared from the grain:

Sample No. I: produced in Naganoken in November 1922.
» No. II: produced in Kanagawaken in November 1923.
» No. III: flour from a market.

hese three samples were analysed with the following results:

	Sample No. I %	Sample No. II. %	Sample No. III. %
H_2O	11.965	12.432	12.645
Dry matter	88.035	87.568	87.355
Cr. protein (N × 6.25)	13.606	13.337	14.250
Protein (N × 6.25)	10.250	10.019	9.381
Cr. fat	2.964	2.889	2.986
Cr. ash	2.276	2.278	2.623
N-free extract	80.161	80.515	78.934
Cr. fibre	1.003	0.981	1.207
Total N	2.177	2.134	2.280
Alb. N	1.640	1.603	1.549
Non-alb. N	0.537	0.531	0.731

Two methods were used to separate the proteins of buckwheat by mea their different solubilities: one was a fractional extraction method and the an individual extraction method. The first method was as follows: 20 gra the flour were extracted with 500 cc. of water and shaken for six hours at temperature; after filtration, 300 cc. of water were added to the residue; the sh and filtration were repeated and the two filtrates were mixed and made up t litre. The nitrogen content of the combined filtrate was then estimated by Kjel method. A 10% saline solution was now added to the previous residue, whic extracted as before. Finally, extraction with 0.2% NaOH solution was carrie The nitrogen content of the various fractions so obtained was as follows:

	Sample No. I %	Sample No. %
Water-soluble N	30.75	40.63
10% NaCl soluble N	5.35	4.61
0.2% NaOH soluble N	45.40	40.27
N remaining in residue	18.50	14.48
Total N	100	100

The second method consisted in extracting separate samples with wate saline solution, 0.2% alkali solution and 70% alcohol solution. During the extraction the temperature was kept constantly at 60° to 70° C.; filtratio estimation were carried out much as in the first method. The results nitrogen determinations were as follows:

	Sample No. I %	Sample No. II %	Sample N %
Water-soluble N	28.72	21.27	39.6
10% NaCl soluble N . . .	48.07	38.99	43.3
0.2% NaOH soluble N . .	81.89	78.81	61.5
70% alcohol soluble N . .	5.01	2.52	2.7
Total N	100	100	100

The above data show that an alkali solution can extract the main bulk of n from the flour, but an alcohol solution extracts only a small quantity.

Solutions extracted by all these solvents except alcohol give protein reactions, and have a more or less viscous character, this being particularly cuous in the case of the alkali solution, which could not be easily filtered cle

The coagulable protein was separated from the filtrate resulting from the extrac- with water by heating at 60° to 70° C. and adding dilute acetic acid. The in yield thus obtained was as follows:

Sample No. 1.

Air-dried matter obtained from 100 grams original flour	3.35 grams
N yield for total N of flour	18.50% as dry matter
N content in the protein	13.95% » » »

The globulin obtained by extraction with saline solution was separated by the ary method of saturation with ammonium sulphate. The results were as follows:

Sample No. 1.

Air-dried matter obtained from 100 grams flour	1.85 grams
N yield for total N of flour	13.50% as dry matter
N content in globulin	15.50% » » »

The alkali-soluble protein solution was treated as follows: from the filtrate otein substance was precipitated by adding acetic acid drop by drop until the ion became faintly acid. This precipitate was filtered and redissolved in alkali ion; after repetition of the precipitation and filtration, the precipitate was ed with water, alcohol and ether and then dried. This crude protein was dark n; it probably consisted chiefly of glutelin and to a less extent of albumin globulin; but, owing to the difficulties of purification of the individual simple ins, it has not been decided how much of the last two was present.
The water, ash and nitrogen content of this substance were as follows:

	Sample No. I %	Sample No. II %	Sample No. III %
H_2O	10.72	4.98	11.50
N (dry matter)	14.874	15.820	13.481
Ash (dry matter)	0.74	0.84	1.08
P_2O_5 (dry matter).	0.36	—	—
Tryptophane (separated) . .	0.4	—	—
Air-dried matter obtained from 100 grams	8.57 gms.	9.79 gms.	8.19 gms.
N yield for total N of flour (dry matter)	60 %	70 %	49 %

The nitrogen distribution among several groups of amino acids was deter by Van Slyke's method as follows:

	Sample No. I		Sample No. II.	
	Dry matter %	Total N %	Dry matter %	Total %
Total N	14.892	100.00	15.820	100.
20% HCl sol. N.	14.352	96.37	14.958	94.
20% HCl insol. N	0.526	3.53	0.843	5.
Humin N	0.151	1.01	0.187	1.
Amide N	1.679	11.28	1.167	7.
Phosphotungstate N	4.586	30.80	4.654	29.
Arginin N	2.247	15.09	2.228	14.
Lysin N	0.732	4.92	0.830	5.
Histidin N	1.416	9.51	1.371	8.
Cystin N	0.191	1.12	0.225	1.
Amino N	1.957	13.14	2.070	13.
Non-amino N	2.629	17.66	2.586	16.
Mono-amino N	7.936	53.29	8.950	56.

Investigation of the nutritive value of the protein:

For these experiments alkali-soluble protein served as the source of p on account of its comparatively large yield; casein was used as a control.

Animals: Albino rats 4 (♂) and 4 (♀).

Rations: Food mixtures as follows:

	Ration No. 1 %	Ration No. 3 %	Ration No. 2 %	Ration No
Protein	20	15	10	
Butter	14	14	14	Same as N
Starch	58	65	70	with the add
Nelson's salt-mixture	6	4	4	of buckwh
Agar	2	2	2	flour.

Note. — Vitamins A, B and C were supplied from the butter, oryzanin cabbage included in the ration.

Periods: From March 20th to December 14th, 1924.

The records of growth of the rats are shown in Figures 1 and 2.

Summary.

Buckwheat flour contains a large amount of aqueous alkali-soluble protein and all amount of coagulable protein and globulin, but no alcohol-soluble protein. olutions obtained by extraction with various solvents were all viscous except alcohol was used as the solvent.

Aqueous alkali-soluble protein contains a large quantity of arginin and histidin. pears to have a high nutritive value for rats, even higher than casein.

Figure 1 (♂).

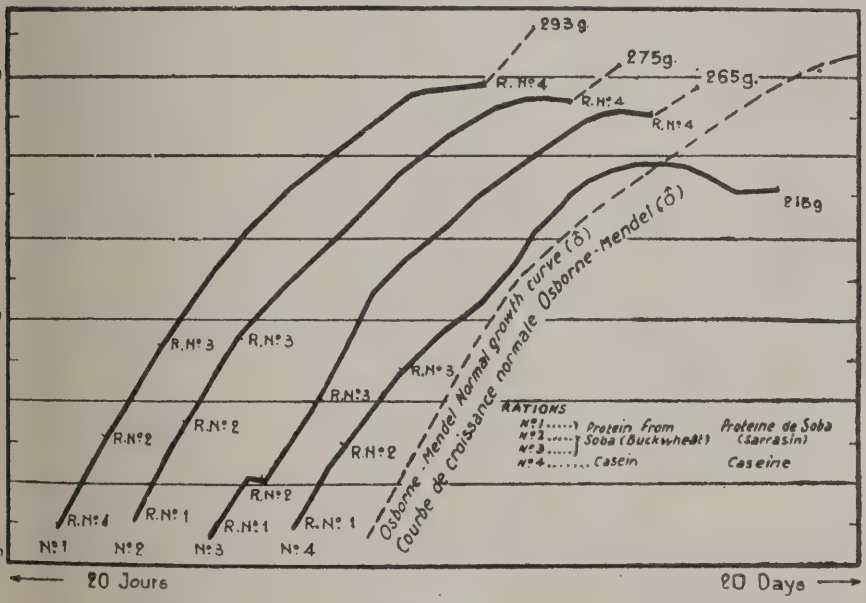
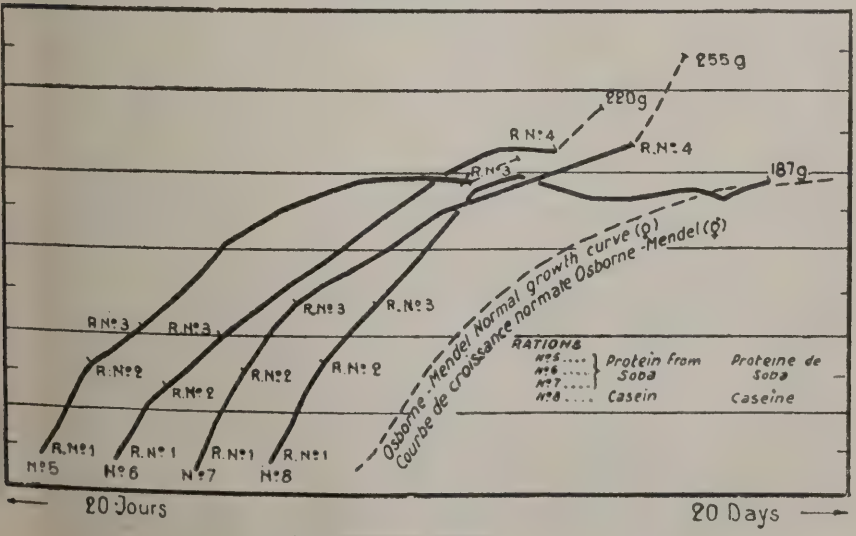


Figure 2 (♀).



18.

VITAMIN CONTENT OF JAPANESE FOOD MATERIALS.

By Y. Shimoda, Y. Fujimaki, H. Matsumuro and S. Saiki
(From the Imperial State Institute for Nutrition, Tokyo).

Purification of Food Materials.

)iet is the most important factor in vitamin work. If due attention is not to the purification of the foodstuffs and their mixing in correct proportions, vestigation will lose its value. The diet must contain all necessary nutritive nts except vitamins, must be adequate to supply the necessary calories, and be digestible and palatable. By the term " perfect diet ", we mean a diet contains an adequate amount of protein, carbohydrate, fat, mineral salts itamins. However, before we prepare a diet with these materials they must rified. I have paid considerable attention to the purification, using the following dures:

Casein used as a Source of Protein.

even or eight pounds of casein were boiled for five or six hours with twice ee times its volume of 90 to 95 per cent alcohol on a water bath, using a reflex nser to prevent the evaporation of alcohol. During the extraction the casein tirred continuously to prevent burning by means of a stirring-rod driven by or. The mixture was filtered by a suction pump and the casein was well washed alcohol. This procedure was repeated twice or three times and the casein was dried and ground to a powder.

Dextrin used as a Source of Carbohydrate.

Dextrin was treated exactly in the same way as the casein.

Olive Oil used as a Source of Fat.

According to some authorities, olive oil does not contain vitamin A. I am not aced of the truth of this statement; in my work it was used merely as a source , but I heated the olive oil twice to 160 to 170° C. for several hours each time. g the heating, the oil was stirred continuously.

Yeast.) I obtained bottom yeast from a brewing company and added a large nt of cold tap water, stirred well and then let it stand for several minutes; s way the yeast was precipitated. The yeast was washed all night and then ops were separated by passing the mixture through a silk sieve; the yeast was compressed and dried by an air dryer and ground into a powder.

Normal Diet (for rats).

	%
Dextrin	65
Casein	18
Olive oil	7
Cod-liver oil	3
Salt mixture	5
Dried bottom yeast	2

Daikon juice was given freely to supply vitamin C.

The salt mixture consisted of:

NaCl	6.5
$MgSO_4H_2O$	13.3
$NaHPO_4H_2O$	10.0
K_2HPO_4	30.0
Ca-lactate	37.0
Fe-citrate	3.0

A trace of KI.

[Daikon or Japanese garden radish: According to Taro Higuchi's ana consists of 95.23 per cent of H_2O, 0.74 per cent of protein, 0.21 per cent 0.55 per cent of fibre, 0.47 per cent of ash and 2.04 per cent of carbohydrat Japanese are very fond of it and eat it all the year round. We investigated its content and found no vitamin A or B, but an abundance of vitamin C. Two the juice per day is sufficient to protect from scurvy a guinea-pig weighing 300 grams. This daikon juice was clarified by adding about 5 per cent of earth and used as a source of vitamin C.]

Vitamin A Deficient Diet (for rats).

	%
Casein	18
Dextrin	65
Olive oil	10
Dried bottom yeast	2
Salt-mixture	5

Ad libitum, daikon juice and water.

Vitamin B Deficient Diet (for albino rats).

	%
Dextrin	65
Casein	20
Olive oil	7
Cod-liver oil	3
Salt-mixture	5

Besides these materials, we gave daikon juice.

Vitamin B Deficient Diet (for pigeons).

	%
Polished rice	81
Casein	12
Cod-liver oil	3
Salt-mixture	4

Vitamin C Deficient Diet (for guinea-pigs).

	%
Oats	54
Casein	25
Cane sugar	5
Cod-liver oil	3
Olive oil	7
Salt-mixture	4
Dried bottom yeast	2

I. VITAMIN B CONTENT OF RICE.

New and Old Rice of Different Grades of Polishing.

ıe authors set out to determine the vitamin B content of new and old unpolished
)%-polished rice, 70%-polished rice and polished rice. Rice polished with
thout the use of sand powder was examined in our experiments.
testing for the antineuritic vitamin we used 50 young pigeons weighing
300 grams, and for the examination of the growth-promoting vitamin we used
ıng white rats weighing 30 to 50 grams. The following experiments were
out.

Experiment I.

) determine the variation in the antineuritic vitamin content of new and old
hed rice after the lapse of one year we took groups of pigeons and gave them a
iet composed of:

	%
Polished rice (polished by adding sand powder)	80
Purified casein	12
Salt-mixture	5
Fat (cod-liver oil)	3

Salt mixture consisting of:

NaCl	6.5
$MgSO_4H_2O$	13.0
$NaHPO_4H_2O$	10.0
K_2HPO_4	30.0
Ca-lactate	37.0
Fe-citrate	3.0

A trace of KI.

the first group of pigeons we introduced daily into the stomach 5 grams of
rice. These pigeons were free from polyneuritis at the end of three months.
the second group of pigeons we introduced daily into the stomach 3 grams
old rice. Seventy-five per cent of the pigeons became polyneuritic in three
.
the third group of pigeons we introduced daily into the stomach 1 gram of the
. All the pigeons became polyneuritic in one month.
the fourth group we introduced daily into the stomach 5 grams of the new
hese pigeons were free from polyneuritis and grew well for over three months.
the fifth group we introduced daily into the stomach 3 grams of the new rice.
pigeons were free from polyneuritis for over three months, and the physical
on of the pigeons was just about the same as that of the pigeons of group I.

In the sixth group we introduced daily into the stomach 1 gram of the n
The pigeons became polyneuritic in about two months.

We conclude that the vitamin B content of unpolished rice which h
stored for one year is less than that of new rice. The ratio of the vitamin B c
is 3 to 5.

Experiment II.

In this experiment we determined the antineuritic vitamin content
polished in different grades, namely, 50%-polished, 70%-polished and well-p
we also compared rice polished with and without sand powder. Groups of
were fed on the basal diet already mentioned.

In the first group we introduced daily into the stomach 5 grams of 50%-p
rice polished without sand powder.

In the second group we introduced daily into the stomach 7 grams
polished rice polished without sand powder.

In the third group we introduced daily into the stomach 10 grams
polished rice polished without sand powder.

In the fourth group we introduced into the stomach 10 grams of well-p
rice polished with sand powder.

The fifth group was given only the basal diet.

The first three groups of pigeons fed on the basal diet, with the add
5 grams of 50%-polished rice, 7 grams of 70%-polished rice, and 10 grams
polished rice, remained well and free from polyneuritis for five months. Howe
physical condition of the pigeons to which we gave 5 grams of 50%-polis
was not as good as that of the pigeons to which we gave 7 grams of 70%-
rice. The physical condition of the pigeons to which we gave 10 grams of polis
was worse than that of the pigeons to which we gave 5 grams of 50%-polis

From these results, we came to the following conclusion: if the anti
vitamin content of unpolished rice is represented as 100, then that of 50%-
rice is 55, that of 70%-polished rice is 43, while that of polished rice is 2
fully polished with sand powder contains no antineuritic vitamin.

Experiment III.

We investigated the growth-promoting vitamin content of new and
and rices of different grades of polishing. For these experiments we used
white rats weighing 30 to 50 grams.

Group I. — Young white rats were fed on a diet composed of:

15% of old unpolished rice,
17% of purified casein,
54% of purified dextrin,
4% of salt mixture,
7% of purified olive oil,
3% of cod-liver oil.

Group II. — Rats received:

15% of new unpolished rice,
17% of purified casein,
54% of purified dextrin,
4% of salt-mixture,
3% of cod-liver oil,
7% of purified olive oil.

e duration of the experiment was six months. The first group of white rats l nearly normal growth, the second group quite normal growth.

up III. — Young white rats were fed on diets containing 15 and 25 per cent unpolished rice, besides purified casein, dextrin, olive oil, cod-liver oil and ture. In neither case was growth quite normal, but the rats receiving ent of rice grew far better than those receiving 15 per cent of rice.

up IV. — Young white rats were fed on diets composed of 25 and 35 per cent polished rice. In neither case did the rats grow normally, although those fed diet containing 35 per cent of rice grew better than those fed on the diet ng only 25 per cent of rice.

up V. — White rats fed on diets composed of 35 and 45 per cent of polished not grow normally. The rats fed with 45 per cent of rice grew better than d on the diet containing 35 per cent of rice.

m these results we can place the rices in the following order as regards owth-promoting activity: first, unpolished rice, then 50%-polished rice, %-polished rice, and lastly polished rice. If the growth-promoting vitamin of unpolished rice is represented as 100, that of 50%-polished rice is 50, 70%-polished rice is 35, and that of polished rice is 20.

will be remembered that if the antineuritic vitamin content of unpolished epresented as 100, that of 50%-polished rice is 55, that of 70%-polished 3, that of well-polished rice is 25, while that of rice polished with sand powder

e vitamin B content is diminished by storage of the rice and also by polishing ent grades. The catalytic action of the enzyme oxidase is diminished by the ctors, according to the work of Dr. Higuchi. We compared the degrees of ion of vitamin B and oxidase and found that they ran parallel.

II. VITAMIN B IN JAPANESE BUCKWHEAT FLOUR

(Fagopyrum esculentum moench).

is commonly believed that buckwheat has a curative effect on beri-beri, one seems to have studied the vitamin B content of buckwheat. We have out three series of experiments on pigeons; in two series we used the prophy- ethod and in the third the curative method.

The First Prophylactic Experiment.

enty young pigeons were divided into five groups of four each. The first ceived a diet lacking vitamin B, the fifth group a normal diet, and the other oups received diets lacking vitamin B to which were added 10, 25 and 50 of buckwheat flour respectively. The results were as follows:

up I. — One died on the 13th day without having any symptoms of lack in B. One developed symptoms due to a lack of vitamin B on the 17th day, on the 20th day and another on the 22nd day.

up II. — One developed symptoms on the 33rd day and the other three developed symptoms when the experiment was discontinued on account reat earthquake on September 1st.

Groups III, IV and V. — One had developed symptoms when the exp was discontinued for the reason given above.

The Second Prophylactic Experiment.

Sixteen young pigeons were divided into four groups of four each. (received a diet lacking vitamin B, and groups II, III and IV received the sa with the addition of 10, 25 and 50 per cent buckwheat flour respectively results were as follows:

	Number of days before symptoms developed	Number of days until death
Group I	19	21
Group II	(Average of 3) 35	(Average of 3) 38
Group III	—	—
Group IV	—	—

None of the birds in groups III and IV had developed symptoms in 8 and one of those in group II failed to develop them in the same time. Gr continued their normal growth, but the growth of groups II and III was no satisfactory.

The Third Experiment (Therapeutic).

Eight young pigeons were fed with a diet lacking vitamin B and, whe beri symptoms developed, they were divided into four groups of two eac 3 and 5 grams of buckwheat flour respectively were given daily by the m the birds of the four groups.

Group I. — With 1 gram there was some curative effect, but it was not su to cure the paralysis and the birds died in two to four days.

Group II. — With 2 grams the paralysis was cured and the body increased, but the birds died in 10 to 11 days.

Group III. — With 3 grams the paralysis was cured in five to eight ho the body weight increased, but the birds did not grow normally.

Group IV. — The paralysis was cured in four to eight hours and normal was resumed.

The foregoing three experiments indicate that buckwheat flour con considerable amount of vitamin B.

III. VITAMIN A IN BUCKWHEAT FLOUR.

Fifty young mice of 25 to 35 grams body weight were fed with a diet vitamin A, and when beri-beri symptoms developed, three each of the mi medium, and severe cases were selected and fed with a diet containing 75 p buckwheat flour, 11 per cent casein, 5 per cent salts, 10 per cent fat, and 2 p yeast.

The results are as follows:

Mild	no effect	died in 23 to 27 days.
Medium	»	died in 15 to 18 days.
Severe	»	died in 5 to 8 days.

The above experiment indicates that buckwheat flour either contains ver or no vitamin A.

IV. VITAMIN B CONTENT OF RED BEANS.

(Phaseolus Mung L.)

(a) *Curative Experiment.*

beans have been widely used for the treatment of beri-beri by the laity
hysicians. It was interesting to find out their actual vitamin B content.
umber of young pigeons received a diet lacking vitamin B and, when symp-
to the lack of vitamin B had developed, they were given a definite quantity
eans (pulverised, sifted through an 80-mesh gauze and then mixed with
With 0.5 gram of beans they were cured of the symptoms, but their body
id not increase and they died in one to three days. With 2 grams they were
the symptoms, but their body weight did not increase and they died in
rty days. With 3 grams they were cured of the symptoms, but their growth
normal.

(b) *Prophylactic Experiment.*

divided a number of young pigeons into two groups, and to one group we
itamin B deficient diet to which were added 2 grams of red beans daily,
he second group a vitamin B deficient diet to which were added 5 grams

first group showed no symptoms of beri-beri in 107 days, but their body
ecreased by 20 to 57 grams. The second group were entirely free from
; their body weight increased and growth was normal.

V. VITAMIN B CONTENT OF BEAN CURD.

(a) *Therapeutic Experiment.*

a well-known fact that beans contain a considerable amount of vitamin B.
her or not foods prepared from them, such as bean curd, contain vitamin B
t known. The authors studied this point by the therapeutic method.
lve young pigeons were given a diet lacking vitamin B for two to three
nd when symptoms due to a lack of vitamin B had developed they were
10 or 20 grams of bean curd.
pigeons fed with 5 grams were not cured and died in one to three days.
pigeons fed with 10 grams were not cured and died in seven days.
pigeons fed with 20 grams were not cured and died in two to four days.
above tests show that bean curd does not contain vitamin B.

(b) *Prophylactic Experiment.*

oung pigeons were divided into two groups, and to the first group was given
1 B deficient diet together with 10 grams of bean curd daily; to the second
s given a vitamin B deficient diet with 20 grams of bean curd daily.

p I. — One of the pigeons showed symptoms of beri-beri on the 23rd day
periment and died the next day. The other pigeons showed symptoms of
n the 82nd to the 110th day of the experiment and died in 89 to 116 days.

p II. — One pigeon showed symptoms of beri-beri on the 24th day and died
th day, another showed symptoms on the 110th day, and died on the 114th

day, while the third showed no symptoms of beri-beri and lost no weigh the experiment.

Fom the above results we concluded that bean curd contains a ve quantity of vitamin B.

VI. VITAMIN B CONTENT OF THE MILK OF BEAN CU

(a) *Therapeutic Experiment.*

It was interesting to discover in which part of the process of prepa bean curd vitamin B was lost. The milk of bean curd was first studied. young pigeons were given a diet lacking vitamin B, and when symptoms d lack of vitamin B had developed, 5, 10, 15 and 20 cc. of the milk were giv

With 5 cc. of the milk they were not completely cured and died in six days.

With 10 cc. they were cured of cramps, but they died in one to five day

With 15 cc. they were cured of the symptoms, but even so they died 33 days.

With 20 cc. they were cured completely and lived until the end of the exp

Thus it appears that the milk of bean curd contains more vitamin B t curd itself and the symptoms of beri-beri in pigeons may be cured with 20 milk.

(b) *Prophylactic Experiment.*

Six young pigeons were divided into two groups; to the first group w a vitamin B deficient diet with 10 cc. of bean-curd milk a day and to th group was given a vitamin B deficient diet with 20 cc. of the milk.

The first group did not show symptoms of beri-beri, but gradually los and at the end of the fourth month their body weight had decreased by a of 27.4 per cent. The second group also showed no symptoms of beri-beri, in weight. At the end of the fourth month, their weight had decreased by a of 14.5 per cent.

From the above results we conclude that bean-curd milk contains more v than does bean curd itself.

VII. VITAMIN A IN LAVER.

Twenty-five young white rats were divided into three groups and g following diets:

Group I. — Ten white rats had 10 per cent of laver.
Group II. — Ten white rats had a normal diet.
Group III. — Five white rats had a vitamin A deficient diet.

The rats of groups I and II grew normally without xerophthalmia, rats of group III developed eye symptoms in 40 to 50 days, and did normally.

We conclude that laver contains a larger amount of vitamin A.

VIII. VITAMIN B IN LAVER.

een young pigeons were divided into two groups.

Group I. — Ten pigeons had 10 per cent of laver.
Group II. — Five pigeons had a vitamin B deficient diet.

up I showed normal growth, but group II did not grow well, developed s of the legs and finally died.

is, laver contains vitamin B. These experiments show that laver contains mount of vitamin A and a medium amount of vitamin B.

IX. VITAMIN A IN LARD.

(a) *Japanese Lard.*

he first series of experiments it was not determined definitely whether lard d vitamin A. In the second series lard was given to white rats which had ed eye symptoms owing to lack of vitamin A; 5, 10, and 15 per cent of lard ed to their diets and its effect was noted.

Group I (fed with 5 per cent of lard) died within 9 to 21 days.
Group II (fed with 10 per cent of lard) died within 9 to 79 days.
Group III (fed with 15 per cent of lard) died within 11 to 109 days.
Group IV (no lard was given) died within 5 to 16 days.

s the lard on the market contains a very small amount of vitamin A. per cent of it added to a diet lacking vitamin A was not sufficient to cure almia.

b) *Vitamin A in Japanese Pharmacopœial Lard and American Lard.*

determine the vitamin A content of Japanese pharmacopœial and American took three groups of white rats with eye symptoms due to the lack of A. In the case of the first two groups, 15 per cent of lard (group I, pharma- lard; group II, American lard) was added to the diet, and, in the case of the up, 15 per cent of olive oil was added, and their effects were noted.

Group I (15 per cent of pharmacopœial lard) died within 12 to 14 days.
Group II (15 per cent of American lard) died within 11 to 15 days.
Group III (15 per cent of olive oil) died within 15 to 17 days.

n the above results we conclude that neither pharmacopœial nor American ains vitamin A.

X. VITAMIN A IN JAPANESE GARDEN RADISH.

ty young albino rats weighing about 30 grams were divided into three groups as follows:

up I was fed on a vitamin A deficient diet together with 15 per cent of garden

Group II was fed on a vitamin A deficient diet without additions.
Group III was fed on a normal diet.

The results were as follows:

	Onset of xerophthalmia	Death
Group I	(Average) 57.5 days	71.6 days.
Group II	» 52 »	81 »
Group III	growth normal.	

Japanese garden radish does not contain vitamin A.

XI. VITAMIN B IN JAPANESE GARDEN RADISH.

Six young pigeons were given a vitamin B deficient diet containing 15 of garden radish. The pigeons showed symptoms of beri-beri in 16 to 22 died in 20 to 30 days. We compared this result with that obtained by givin a vitamin B deficient diet without radish and found no difference between

XII. VITAMIN C IN JAPANESE GARDEN RADISH.

It an earlier experiment it was found that garden radish contained a tively large amount of vitamin C; we therefore tested it quantitatively. A of young guinea-pigs were divided into groups and treated as follows:

Group I was given 5 cc. of juice of radish by mouth daily.
Group II was given 2 cc. ,, ,, ,, ,,
Group III was given 1 cc. ,, ,, ,, ,,
Group IV received no radish juice.

The results were as follows:

Group I. — Sufficient growth.
Group II. — Very little growth.
Groups III and IV. — No growth, died with scurvy in an average of

Thus the juice of garden radish contains a large amount of vitamin minimum requirement of young guinea-pigs weighing from 200 to 300 2 cc. a day.

Vitamin C in Different Portions of the Garden Radish.

It is interesting to find out which portion of the radish contains most v Fifteen guinea-pigs were divided into three groups of five each.

Group I had a vitamin C deficient diet.
Group II had 2 grams of radish peelings besides a vitamin C deficient
Group III had 2 grams of the edible part of the radish besides a deficient diet.

The results were as follows:

	Symptoms of scurvy	Death
Group I	(Average) 16 days	(Average) 28 days
Group II	No symptoms; continued to grow normally.	
Group III	(Average) 33 days	(Average) 50 days.

Thus vitamin C is present mainly in the peelings of garden radish.

ITAMIN A IN THE LEAVES OF THE JAPANESE GARDEN RADISH.

young white rats with vitamin A deficiency symptoms were fed with various
of the green leaves of the garden radish and were watched to note the
the change of diet.
rat which had marked eye symptoms due to a lack of vitamin A was fed
rams of the leaves. It improved gradually and showed an increase of body

ee rats which had ceased growth were fed with 3 grams of the leaves; they
grow and improved generally.
ee rats which had quite well-marked eye symptoms were cured after receiving
of the leaves; their body weight gradually increased.
ee rats with eye symptoms were fed with 1 gram of the leaves. They all
y improved and resumed normal growth; their xerophthalmia was cured
week.
s the leaves of the garden radish contain a considerable amount of vitamin A.

XIV. VITAMIN C IN PICKLED VEGETABLES.

min C in Japanese Garden Radish Pickled in Salt, and in Rice-polishing Paste.

report has ever appeared on the food value of various pickles which have
l place in Japanese foods. The present investigation was undertaken to
ne the vitamin C content of these pickles.
een young guinea-pigs were divided into three groups of five each.
up I received a vitamin C deficient diet; group II received a vitamin C
diet together with 3 grams of radish pickled in rice-paste; group III
a vitamin C deficient diet together with 3 grams of radish pickled in salt.
results were as follows:

	Symptoms of scurvy		Death	
Group I	(Average)	16 days	(Average)	28 days
Group II	»	16 »	»	35 »
Group III	»	24 »	»	46 »

en radish is pickled in paste its vitamin C is almost entirely lost; when
in salt its vitamin C is greatly decreased. The reason why vitamin C is
d in pickled radish is that there has been a change in osmotic pressure, so
vitamin is removed by osmosis; there is also some destructive action of an
acid in the paste. The fact that microscopically the cells of the radish pickled
are markedly shrunken and that vitamin is found in the peelings indicates
loss is due to osmotic action.

(b) *Vitamin C in Salt-pickled Hakusai.*

ır guinea-pigs were given a vitamin C deficient diet with 5 grams of salt
" hakusai " [1]. The animals continued to grow normally. When 5 grams

[1] "Hakusai" is Chinese cabbage.

of salt-pickled " hakusai " were given to animals which already had sym
vitamin C insufficiency, the symptoms improved and they started to grow r
These experiments show that salt-pickled " hakusai " contains a fairly large
of vitamin C.

The foregoing experiments indicate that the decrease of vitamin C in v
pickled in yeast and rice bran is due not only to changes in osmotic pres
also to some organic acid in the salt rice-polishing mixture. The destructi
of organic acids and the loss due to osmotic pressure are being further inve

(c) *Vitamin C in Cabbage, Egg Plant and Cucumbers pickled in a S*
Rice-polishing Mixture.

Twenty guinea-pigs were divided into four groups of five each.

Group I received a vitamin C deficient diet.
Group II received cucumbers pickled in a salt rice-polishing mi
Group III received egg plant pickled in the same mixture.
Group IV received cabbage pickled in the same mixture.

Only two or three animals survived throughout the experiment on
of the rainy season, so the results were not satisfactory. The experimen
repeated and the results thus far obtained are as follows:

1. Salt rice-polishing pickled cucumbers contain a small a
vitamin C.
2. Salt rice-polishing pickled egg plant contains a slight a
vitamin C.
3. Salt rice-polishing pickled cabbage contains only a trace of v

XV. VITAMIN A IN JAPANESE SOUR PICKLED PLUMS

We took two groups of white rats with symptoms of xerophthalm
lack of vitamin A. In the case of the first group, 10 per cent of sour pick
was added to a diet which lacked vitamin A, and to the second group a
deficient diet alone was given. We found that there was no noticeable
between the first and second groups; therefore, vitamin A is not present
plums.

XVI. VITAMIN B IN JAPANESE SOUR PICKLED PLUMS

Twelve young pigeons were divided into two groups; the first grou
daily on a vitamin B deficient diet together with 5 grams of sour pickl
the second group was fed on a vitamin B deficient diet only.

The results were as follows:

	Onset of beri-beri		Death	
Group I	(Average)	18 days	(Average)	26 days
Group II	»	25 »	»	29 »

Thus sour pickled plums do not contain vitamin B.

VII. VITAMIN C IN JAPANESE SOUR PICKLED PLUMS.

Experiment I.

young guinea-pigs weighing about 200 grams were divided into two groups; as given a vitamin C deficient diet with 0.5 gram of neutralised sour plums p II was given a vitamin C deficient diet alone.
results were as follows:

	Onset of scurvy	Death
Group I	(Average) 24 days	(Average) 27 days
Group II	» 24 »	» 27 »

nay conclude that sour pickled plums have no appreciable vitamin C content.

Experiment II.

ve young guinea-pigs weighing about 200 grams were divided into three nd were fed as follows:

Group I. — Vitamin C deficient diet with neutralised plum juice, 1 gram .

Group II. — Vitamin C deficient diet with neutralised plum juice, 1 cc. .

Group III. — Vitamin C deficient diet alone.

results were as follows:

	Onset of scurvy	Death
Group I	(Average) 16 days	(Average) 25 days.
Group II	» 12 »	» 22 »
Group III	» 17 »	» 23 »

may conclude that pickled plums do not contain much vitamin C.

XVIII. VITAMIN A IN JAPANESE SUMMER ORANGE.

ty young albino rats weighing from 41 to 53 grams were divided into three Group I was supplied with vitamin A in the form of butter. Group II n a diet lacking in vitamin A. Group III was given a diet lacking in vitamin er with 20 per cent of the juice of summer orange.

Group I. — No symptoms of xerophthalmia even after 112 days, and th was normal.

Group II. — Symptoms of xerophthalmia appeared in an average of 46 and death occurred in an average of 65 days.

Group III. — Symptoms of xerophthalmia appeared in an average of 53.5 and death occurred in an average of 79 days.

r eye symptoms had developed in one of the rats of group II, summer orange given (33 per cent of the diet). There was a tendency to healing of the s and an increase in body growth.

e seems to be some vitamin A in the juice of the summer orange.

ITAMIN B IN TAPES PHILIPPINARUM (FRESH-WATER SHELL-FISH, ASARI).

young pigeons were divided into two groups and given a vitamin B deficient oup I received 4 cc. of an alcoholic extract of the shell-fish (equal to 6 grams

of fresh asari) by mouth every day. Group II received the vitamin B diet alone.

Group I developed symptoms of insufficiency in an average of 2 and died in 26 days.

Group II developed symptoms of insufficiency in an average of 2 and died in 27.5 days.

The shell extract had no effect; we conclude that *Tapes philip* (asari) contains no vitamin B.

XX. VITAMIN A IN OYSTERS.

In the previous experiment we reported the vitamin B content of t water shell-fish shijimi or asari. The present report is concerned with the of vitamin A in the oyster. Twenty white rats with symptoms due to lack of A were divided into five groups of four each. The results were as follows

Group I. — Vitamin A deficient diet with 1 gram of oyster a da in 18 to 37 days, average 28 days.

Group II. — Vitamin A deficient diet with 2 grams of oyster a da in 19 to 33 days, average 27 days.

Group III. — Vitamin A deficient diet with 3 grams of oyste cured in 10 to 27 days, average 16 days.

Group IV. — Vitamin C deficient diet with 4 grams of oyster a da in 7 to 20 days, average 10 days.

The oyster contains a considerable amount of vitamin A.

XXI. VITAMIN A CONTENT OF CANNED MEATS.

Since the great earthquake occurred in September 1922, the consum canned foods has increased greatly. We have therefore studied the vi content of the following canned meats: corned beef, salmon and crab.

(a) *Vitamin A Content of Corned Beef.*

Fifteen young albino rats weighing about 25 grams were divided in groups.

Group I was fed on a vitamin A deficient diet.

Group II was fed on a vitamin A deficient diet with 1 gram of co daily.

Group III was fed on a vitamin A deficient diet with 3 grams of co daily.

The results were as follows:

Group I. — The growth of the rats was poor; symptoms of xerop appeared in an average of 39.5 days and death occurred in an average of

Group II. — One of the rats showed symptoms of xerophthalmia cured spontaneously, the other four rats did not develop xerophthalmia growth was normal.

Group III. — Two rats showed symptoms of xerophthalmia after but were cured spontaneously; their growth was normal. The other grew normally.

ıtic Experiment.

ənty young white rats were divided into four groups. These rats all had ns of xerophthalmia due to lack of vitamin A. To the first group a vitamin ənt diet was given; to the second group was given a vitamin A deficient diet with 3 grams of corned beef a day; to the third group was given a vitamin A diet with 5 grams of corned beef a day; to the fourth group was given a A deficient diet with 10 grams of corned beef a day.

first group died in from 7 to 15 days, while the other three groups were cured hthalmia and grew normally.

ıs, corned beef contains some vitamin A.

(b) *Vitamin A Content of Canned Crab.*

ɛeen young white rats with symptoms of xerophthalmia due to lack of vitamin divided into four groups.

Group I was given a vitamin A deficient diet alone.

Group II was given a vitamin A deficient diet with 3 grams of canned crab y.

Group III was given a vitamin A deficient diet with 5 grams of canned crab y.

Group IV was given a vitamin A deficient diet with 10 grams of canned crab y.

e results were as follows:

ne of the animals in any of the four groups were cured of xerophthalmia. They and there was no difference in the duration of life between group I and the ree groups. Therefore, there was no recognisable vitamin A in canned crab.

(c) *Vitamin A Content of Canned Salmon.*

ɛeen white rats weighing about 25 grams were divided into three groups. To was given a vitamin A deficient diet alone, to group II was given a vitamin A diet with 3 grams of canned salmon daily, to group III was given a vitamin A diet with 5 grams of salmon daily.

e results were as follows:

Group I. — The rats showed symptoms of xerophthalmia in from 30 to days, and died in 40 to 52 days.

Group II. — One of the rats showed symptoms of xerophthalmia on the h day and died on the 56th day of the experiment; the other four rats grew mally.

Group III. — All grew normally.

ıtic Experiment.

took two groups of white rats with symptoms of xerophthalmia due to lack in A. To the first we gave a vitamin A deficient diet with 3 grams of salmon nd to the second group we gave a vitamin A deficient diet with 5 grams of a day.

he first group the symptoms were not cured and all died, but in the second ıe symptoms were cured and all grew normally.

m these results we conclude that canned salmon contains some vitamin A.

XXII. VITAMIN A IN DRIED HERRING.

Eighteen young white rats were divided into three groups and were
following diets:

To the first group was given a vitamin A deficient diet alone, to the sec
a vitamin A deficient diet with 1 gram of dried herring daily, to the thir
vitamin A deficient diet with 3 grams of dried herring daily.

Group I developed xerophthalmia in 37 to 67 days, and died in
days.

Group II developed xerophthalmia in 57 to 125 days, and died
169 days.

Group III had not developed xerophthalmia in six months,
normally.

We concluded that dried herring contains a medium amount of vitam

XXIII. VITAMIN A IN DRIED HERRING-ROE.

Twenty-five young white rats were divided into three groups, and v
the following diets:

To the first group was given a vitamin A deficient diet alone, to t
group a vitamin A deficient diet of which 10 per cent was dried herring-r
third group a vitamin A deficient diet 20 per cent of which was dried he

Group I developed xerophthalmia in 32 to 75 days, and died
98 days.

Group II developed xerophthalmia in 83 to 118 days and died
131 days.

Group III developed xerophthalmia in 100 to 139 days, and died
170 days.

The rats receiving 20 per cent of dried herring-roe lived longest of
came those receiving 10 per cent dried herring-roe; those fed on a vitamin A
diet alone were the first to die.

From the above results we concluded that dried herring-roe cont
vitamin A.

XXIV. VITAMIN A IN EELS.

Eels are eaten in Japan a great deal; we therefore decided to investi
vitamin A content.

Fifteen young white rats were divided into three groups, and were
following diets:

Group I a vitamin A deficient diet alone.
Group II a vitamin A deficient diet with 0.5 grams of broiled e
Group III a vitamin A deficient diet with 1 gram of broiled eel.

The results were as follows:

Group I. — The rats developed xerophthalmia in 32 to 75 days an
50 to 90 days.

Group II. — Except in the case of one rat, growth was normal
was freedom from xerophthalmia.

Group III. — Normal growth.

A number of young rats were given a diet lacking vitamin A and when s
due to lack of vitamin A had developed 0.2 grams, 0.5 grams, 1 gram an
of eel were added.

th 0.2 grams they were not cured of the symptoms and soon died.
th 0.5 grams, 1 gram and 3 grams they were cured of the symptoms com-
and resumed normal growth.
om the above results we conclude that eel contains a considerable amount
in A.

XXV. VITAMIN A IN LAMPREY.

(Entosphemis japonicus.)

Experiment I.

ver lamprey has been used for a long time by the laity for the cure of hemera-
t is interesting to determine whether or not this kind of eel contains vitamin A.
white rats with symptoms due to lack of vitamin A were divided into two
ot three each and fed with 1 gram and 0.5 gram of the lamprey in addition
liet lacking vitamin A.
e results were as follows:

Group I. — Cured in 3 to 6 days and resumed growth.
Group II. — „ „ 9 to 15 „ „ „ „

is indicates that the lamprey *(Entosphemis j.)* contains a large amount of
A.

Experiment II.

xt ten young white rats were given a diet lacking vitamin A and, when symp-
ıe to lack of vitamin A had developed, 0.1 and 0.2 gram of dried lamprey
lded to the diet.
th 0.1 gram as well as with 0.2 gram they were cured of the symptoms
ely and resumed normal growth.
us in young white rats less than 0.1 gram of dried lamprey daily supplies
iency of vitamin A.

19.

EFFECT OF ALKALOIDS ON ANIMALS FED ON DIETS DEFICIENT IN VITAMINS.

By Sanetoshi Saiki

(From the Imperial State Institute for Nutrition, Tokyo).

arried out the following experiments to compare the effect of alkaloids on fed on vitamin deficient diets with their effect on animals fed on a normal

Experiment I.

ung albino rats weighing 25 to 50 grams were fed on a normal diet for five . The food materials were well purified and mixed as in the accompanying ion:

	%
Dextrin	65
Casein	18
Olive oil	7
Cod-liver oil	3
Salt mixture	5
Dried bottom yeast	2

e salt mixture was made up as follows:

	%
NaCl	6.5
$MgSo_4H_2O$	13.0
$NaHPO_4H_2O$	10.0
$K_2PHO_4H_2O$	30.0
Ca-lactate	37.0
Fe-citrate	3.0

A trace of KI.

lected 63 rats fed on the diet mentioned above, injected them hypodermically solution containing 0.5 gm. of strychnine nitrate in one litre of H_2O, and d their resistance to the drug. The doses used for injection were 0.0005 gm.,

0.0004 gm., 0.00035 gm., 0.0003 gm., 0.00028 gm., 0.00025 gm., 0.0002 gm. gm., 0.00015 gm., and 0.0001 gm., per 100 gms. of body weight.

The following table gives a summary of the results:

	0.0005 gm.	0.0004 gm.	0.00035 gm.	0.003 gm.	0.00028 gm.
Number killed. . .	2	7	10	13	2
Number survived .	0	0	0	2	0
Death rate	100 %	100 %	100 %	87 %	100 %

	0.00025 gm.	0.0002 gm.	0.00017 gm.	0.00015 gm.	0.0001 gm,
Number killed. . .	3	4	4	3	0
Number survived .	0	3	2	2	6
Death rate	100 %	57 %	66 %	60 %	0 %

Experiment II.

Young but fairly - well - grown rats were fed on a diet deficient in v for 42 to 76 days.

The diet was composed of:

	%
Casein	18
Dextrin	65
Olive oil	10
Dried bottom yeast	2
Salt mixture	5

I selected 21 animals fed on the above-mentioned diet, and injected th strychnine as before, observing their resistance to the drug. The doses injection were much the same as in the last experiment. The following res obtained:

	0.0005 gm.	0.0004 gm.	0.00035 gm.	0.0003 gm.	0.00025 gm.
Number killed. . .	2	2	1	1	2
Number survived .	0	1	0	0	1
Death rate	100 %	66 %	100 %	100 %	66 %

	0.0002 gm.	0.0015 gm.	0.0001 gm.
Number killed. . .	2	1	0
Number survived .	3	3	2
Death rate	40 %	25 %	0 %

Experiment III.

A number of young albino rats were fed on a vitamin B deficient diet 76 days; 23 of them were then injected with strychnine as before. The

were used: 0.0003 gm., 0.00025 gm., 0.0002 gm., 0.00015 gm., and 0.0001 gm. 00 grams of body weight. I obtained the following results:

	0.0003 gm.	0.00025 gm.	0.0002 gm.	0.0015 gm.	0.0001 gm.
Number killed . . .	3	2	2	1	0
Number survived .	1	2	3	5	4
Death rate	75%	50%	40%	16%	0%

Experiment IV.

a) Young guinea-pigs were fed on a normal diet composed of:

	%
Oats	59
Casein	25
Salt-mixture	4
Olive oil	7
Cod-liver oil.	3
Dried bottom yeast	2

Daikon juice *ad libitum* as a source of vitamin C.

I selected 40 animals and injected them with the following amounts of strychnine 00 grams of body weight: 0.0005 gm., 0.0004 gm., 0.00035 gm., 0.0003 gm., 025 gm., and 0.0002 gm. I obtained the following results:

	0.0005 gm.	0.0004 gm.	0.00035 gm.	0.0003 gm.	0.00025 gm.	0.00002 gm.
ber killed	2	5	4	3	0	0
ber survived . . .	0	4	6	6	8	2
h rate	100%	55%	40%	33%	0%	0%

(*b*) Fairly-well-grown guinea-pigs were fed on a vitamin C deficient diet for 53 days. Nineteen were selected for the following experiment. The diet was composed of:

	%
Oats	59
Casein	25
Salt–mixture	4
Olive oil	7
Cod-liver oil	3
Dried bottom yeast	2

The following amounts of strychnine were injected hypodermically per 100 s of body weight. I obtained the following results:

	0.0005 gm.	0.0004 gm.	0.00035 gm.	0.0005 gm.
Number killed . .	2	3	0	0
Number survived .	0	6	4	4
Death rate	100%	33%	0%	0%

These experiments are very delicate and easily influenced by the conditions; fore I paid special attention to obtaining as nearly identical conditions as ble. Death was decided to have occurred when the corneal reflex had disappeared

When these experiments were performed, the intervals that elapsed fr
time of injection of strychnine to the onset of cramp, from the time of in
of strychnine to death, and from the time of onset of cramp to death, we
carefully recorded. The fatal doses might require in the different groups d
times to produce their effects, and further light might thus be thrown on the p
of increase or decrease of sensitiveness to strychnine.

These various times are shown in the following tables:

Rats fed on a Normal Diet.

Dose de strychnine par 100 gr. d'animal (gr.) Dose of strychnine per 100 gms. of body weight (gms.)	Nombre d'animaux Total number of animals	Nombre de morts Number of deaths	Mortalité (%) Death rate %	Temps moyen nécessaire à l'apparition de convulsions Average time required for cramp to appear	Temps moyen qui sépare l'injection de la mort Average time required from injection to death	Temps entre les sions et Averag requ from to d
0.0005	2	2	100	16′ 35″	20′ 58″	4′
0.0004	7	7	100	18′ 09″	21′ 09″	3′
0.00035	10	10	100	13′ 03″	18′ 16″	5′
0.0003	15	13	87	20′ 14″	26′ 00″	5′
0.00028	2	2	100	15′ 23″	17′ 13″	1′
0.00025	3	3	100	31′ 16″	37′ 06″	5′
0.0002	7	4	57	18′ 53″	26′ 28″	7′
0.00017	6	4	66	14′ 29″	19′ 30″	5′
0.00015	5	3	60	13′ 12″	16′ 58″	3′
0.0001	6	0	0	—	—	

Rats fed on a Vitamin A Deficient Diet.

Dose de strychnine par 100 gr. d'animal (gr.) Dose of strychnine per 100 gms. of body weight (gms.)	Nombre d'animaux Total number of animals	Nombre de morts Number of deaths	Mortalité (%) Death rate %	Temps moyen nécessaire à l'apparition de convulsions Average time required for cramp to appear	Temps moyen qui sépare l'injection de la mort Average time required from injection to death	Temps entre les sions et Averag requ from to d
0.0005	2	2	100	7′ 40″	24′ 40″	7′
0.0004	3	2	66	9′ 20″	13′ 20″	4′
0.00035	1	1	100	—	—	—
0.0003	1	1	100	37′ 05″	38′ 55″	1′
0.00025	3	2	66	11′ 44″	12′ 48″	1′
0.0002	5	2	40	37′ 39″	56′ 42″	19′
0.00015	4	1	25	13′ 00″	14′ 30″	1′
0.0001	2	0	0	—	—	—

Rats fed on a Vitamin B Deficient Diet.

se de chnine 100 gr. nimal gr.) se of chnine 0 gms. of weight ms.)	Nombre d'animaux Total number of animals	Nombre de morts Number of deaths	Mortalité (%) Death rate %	Temps moyen nécessaire à l'apparition de convulsions Average time required for cramp to appear	Temps moyen qui sépare l'injection de la mort Average time required from injection to death	Temps moyen entre les convulsions et la mort Average time required from cramp to death
0003	4	3	75	15′ 33″	33′ 54″	18′ 21″
00025	4	2	50	11′ 50″	16′ 25″	4′ 35″
0002	5	2	40	14′ 55″	18′ 00″	3′ 05″
00015	6	1	16	12′ 00″	17′ 40″	5′ 40″
0001	4	0	0	—	—	—

Guinea-pigs fed on a Normal Diet.

se de chnine 100 gr. nimal gr.) se of chnine 0 gms. of weight ms.)	Nombre d'animaux Total number of animals	Nombre de morts Number of deaths	Mortalité (%) Death rate %	Temps moyen nécessaire à l'apparition de convulsions Average time required for cramp to appear	Temps moyen qui sépare l'injection de la mort Average time required from injection to death	Temps moyen entre les convulsions et la mort Average time required from cramp to death
0005	2	2	100	16′ 28″	32′ 50″	16′ 22″
0004	9	5	55	7′ 53″	15′ 58″	8′ 05″
00035	10	4	40	14′ 23″	45′ 23″	30′ 49″
0003	9	3	33	—	15′ 00″	—
00025	8	0	0	—	—	—
0002	2	0	0	—	—	—

Guinea-pigs fed on a Vitamin C Deficient Diet.

se de chnine 100 gr. nimal gr.) se of chnine 0 gms. of weight ms.)	Nombre d'animaux Total number of animals	Nombre de morts Number of deaths	Mortalité (%) Death rate %	Temps moyen nécessaire à l'apparition de convulsions Average time required for cramp to appear	Temps moyen qui sépare l'injection de la mort Average time required from injection to death	Temps moyen entre les convulsions et la mort Average time required from cramp to death
0005	2	2	100	6′ 22″	7′ 25″	1′ 03″
0004	9	3	33	4′ 40″	12′ 55″	8′ 15″
00035	4	0	0	—	—	—
0003	4	0	0	—	—	—

As shown in the tables, there is considerable individual variation in th required for the symptoms to develop: these times bear no special rela differences in the diets.

Summary:

1. The effect of injection of strychnine is different in the case of rats f normal diet and those fed on a vitamin deficient diet.
2. Rats fed on a normal diet react to relatively small doses of strychn
3. Rats fed on a vitamin A deficient diet can stand larger doses of str than those fed on a normal diet.
4. Rats fed on a vitamin B deficient diet can stand larger doses of str than those fed on a normal diet, but not so large as rats fed on a A deficient diet.
5. Guinea-pigs fed on a vitamin C deficient diet can stand larger d strychnine than those fed on a normal diet.
6. Whether these differences are due to increase of resistance or dec sensitiveness cannot be decided without further investigation.

20.

RELATIONSHIP BETWEEN THE QUANTITY ALTS IN A DIET AND VITAMIN A DEFICIENCY.

By Fuichi Nakamura

(From the Imperial State Institute for Nutrition, Tokyo.)

ıe relationship between the quality of inorganic salts in a food mixture and ı A deficiency has been investigated by various workers, but I have not heard work concerned with the relationship between the total quantity of salt e in a diet and vitamin A deficiency. Therefore I performed the following ıents.

Experiment I.

ıung albino rats were divided into three groups. To the first group was given ıin A deficient diet containing only 0.5 per cent of a salt mixture.
ıe diet was composed of:

	%
Purified casein	15
Polished-rice flour	75
Olive oil	10
Orizanin	0.6
Salt mixture	0.5

ıe salt mixture was composed of:

NaCl	6.5
$MgSO_4H_2O$	13.0
$NaHPO_4H_2O$	10.0
K_2HPO_4	30.0
Ca-lactate	37.0
Fe-citrate	3.0
KI	0.5

ıe second group of animals were fed on a vitamin A deficient diet containing ent of the salt mixture.
ıe diet was composed of:

	%
Purified casein	15
Polished-rice flour	75
Olive oil	10
Orizanin	0.6
Salt mixture	2

To the third group was given a vitamin A deficient diet containing 5 per
salt mixture.

The diet was composed of:

	%
Purified casein	15
Polished-rice flour	75
Olive oil	10
Orizanin	0.6
Salt mixture	5

The first group of rats grew well for the first two or three weeks, but aft
they did not grow so well; some of them developed xerophthalmia, while othe
without developing xerophthalmia. The second group of rats grew much
than the first group and lived longer. The third group of rats did far worse t
other two and died much sooner.

In short, to prolong the life of animals fed on a vitamin A deficient d
optimum amount of salt mixture should be added.

21.

ORMATION OF URINARY AND BILE-DUCT LCULI IN ANIMALS FED ON EXPERIMENTAL RATIONS.

By Yoshitomo Fujimaki

(From the Imperial State Institute for Nutrition, Tokyo).

I.

lculi have long afflicted the human race; Eliott Smith has found urinary in mummies supposed to be 4,000 years old. Hippocrates (460-377 B.C.) obably the first man who ever discussed the cause of the formation of calculi. is time numerous hypotheses have been advanced in regard to the formation ili, but none have proved satisfactory. Chworastansky found kidney stones er cent of 58 rachitic patients. Uyeda has found kidney stones in dogs kept ed polished rice and distilled water. Osborne and Mendel have found urinary in rats fed on experimental rations.

rschner and Clemm observed that, in Germany, gall-stones were found more nly in people who took diets containing only a small amount of fat. Moreover, claims a definite relationship between beri-beri and calculi.

uring the early years of investigation of the vitamin content of Japanese aterials, under the supervision of Dr. Saiki, I recognised a number of urinary e-duct calculi among rats kept for a long period on vitamin A poor or free I thought that there must be a certain relationship between the formation retions and dietetic factors, especially vitamins and mineral salts; in pursuance idea I tried to determine whether vitamin A, vitamin B, vitamin C, vitamin A or vitamin B and C, or some other factor such as mineral salts, especially and phosphorus, or protein deficiency combined with the vitamin A poor diet, were the cause of the formation of concretions. I carried out the follow- periments.

Purification of Food Materials.

e experimental diets used in vitamin work must contain the necessary nutri- ments and must be adequate to supply the necessary calories; they must digestible and palatable. By the term " perfect diet ", we mean a diet which s an adequate amount of protein, carbohydrate, fat, mineral salts and vitamins. er, before we make up a diet with these materials they must be purified. paid considerable attention to the purification, using the following methods:

(a) *Casein used as a source of protein.*

Seven or eight pounds of casein were boiled for five or six hours with three times its volume of 90 to 95% alcohol on a water bath, using a reflex co to prevent the evaporation of alcohol. During the extraction the casein wa continuously by a motor. The mixture was filtered with a suction pump casein was then well washed with alcohol. This procedure was repeated three times and the casein was then dried and ground to a powder.

(b) *Dextrin used as a source of carbohydrate.*

Dextrin was treated exactly in the same way as casein and made into a

(c) *Olive oil used as a source of fat.*

According to some authorities, olive oil does not contain vitamin A; I convinced of the truth of this statement. However, in my work it was used as a source of fat, but I heated the olive oil twice to 160°-170° C. for sever each time. During the heating, the oil was stirred constantly.

(*d*) I obtained bottom yeast from a brewing company and added to it amount of cold tap water; after stirring well it was allowed to stand for minutes till the yeast was precipitated. The yeast was then washed all nig the hops were removed by means of a silk sieve; the yeast was compressed a by an air dryer and ground into a powder.

Experiment 1. — *Animals fed on a Vitamin A Deficient Diet.*

(*a*) One hundred and seven albino rats were fed on a vitamin A defici The majority of the rats weighed 25 to 30 grams at the beginning of the exp although some of them were well grown and weighed 200 to 300 grams more. Young rats fed on the vitamin A free diet did not survive long, so I occa fed them with a normal diet to keep them alive. The food materials w purified and mixed as in the accompanying tabulation:

	%
Casein	18
Dextrin	65
Olive oil	10
Dried bottom yeast	2
Salt mixture	5

Daikon juice to supply vitamin C and water *ad libitu*

The salt mixture consisted of:

	%
NaCl	6.5
$MgSO_4H_2O$	13.0
$NaHPO_4H_2O$	10.0
K_2HPO_4	30.0
Ca-lactate	37.0
Fe-citrate	3.0

A trace of KI.

Forty-one of the 107 rats were kept on this diet for periods of from 30 days, but no calculi were found; 13 rats were kept for 41 to 50 days a

(23 per cent) had bladder stones, but none had kidney or bile-duct stones; were kept for 51 to 80 days and six cases (37 per cent) of bladder stones and (6 per cent) of kindney stones were found, but no bile-duct stones; six e kept for 81 to 100 days and five cases (83 per cent) of bladder stones and s (33 per cent) of kidney stones were found, but no bile-duct stones; eight e kept for 120 to 140 days and eight cases (100 per cent) of bladder stones, (75 per cent) of kidney stones and one case (12 per cent) of bile-duct stones nd; eight rats were kept for 150 to 210 days and in seven cases (85 per cent) ere bladder stones, in six cases (75 per cent) kidney stones and five cases cent) bile-duct stones; six rats were kept for 245 to 376 days and all six had stones (100 per cent), five (83 per cent) had both kidney and bile-duct stones.

se experimental data are shown in the following table (rats kept less than are not included):

Sexe Sex	Poids — Body weight		Apparition de la xérophtalmie Symptom of xerophthalmia appears	Durée du régime Duration of feeding	Calculs — Calculi		
	Début de l'expér. Beginning of experiment	Fin de l'expér. End of experiment			Vessie Bladder	Rein Kidney	Voies biliaires Bile duct
	gr.-gms.	gr.-gms.	Jours-Days	Jours-Days			
♀	22	48	32	39	—	—	—
♀	20	37	—	32	—	—	—
♀	37	105	—	31	—	—	—
♂	32	99	—	32	—	—	—
♂	25	80	—	31	—	—	—
♀	32	58	27	35	+	—	—
♂	31	47	—	36	—	—	—
♀	29	50	—	32	—	—	—
♀	27	23	—	40	—	—	—
♂	31	90	—	49	—	—	—
♀	40	71	43	49	—	—	—
♀	52	12	11	49	+	—	—
♂	54	159	21	49	—	—	—
♂	43	115	11	48	—	—	—
♂	50	180	—	49	—	—	—
♂	47	129	21	50	—	—	—
♂	32	53	14	42	—	—	—
♀	35	55	35	42	—	—	—
♀	45	114	34	41	—	—	—
♂	20	61	39	43	—	—	—
♂	32	65	32	50	+	—	—
♀	47	105	36	48	++	—	—
♂	35	82	42	56	—	—	—
♂	34	72	35	53	+	—	—
♂	25	116	—	60	—	—	—
♂	25	70	38	59	—	—	—
♀	25	82	36	58	—	—	—

N° de l'animal No. of animal	Sexe Sex	Poids — Body weight		Apparition de la xérophtalmie Symptom of xerophthalmia appears	Durée du régime Duration of feeding	Calculs — Ca	
		Début de l'expér. Beginning of experiment	Fin de l'expér. End of experiment			Vessie Bladder	Rein Kidney
		gr.-gms.	gr.-gms.	Jours-Days	Jours-Days		
228	♀	25	76	38	55	+	—
2	♀	46	65	40	56	—	—
221	♂♀	32	108	—	62	+	—
234	♀♀	31	130	39	62	+	+
242	♀♀	46	54	41	63	+	—
51	♀♀	25	82	—	75	+	—
243	♀♀	50	145	28	70	—	+
4	♂♀	61	91	48	73	—	—
3	♂♀	44	89	—	77	—	—
8	♂♂	37	113	26	76	+	—
7	♂♂	42	85	35	66	—	—
238	♂♂♀	44	128	—	87	+	—
239	♂♀	41	86	31	81	+++	++
240	♂♂♀	39	113	65	81	+	—
225	♂♂♀	23	80	41	88	+	—
232	♀♀	32	120	35	94	+	+
6	♂♀	51	93	64	88	—	—
9	♂♂	56	181	35	127	++	+
236	♂♂	35	213	50	121	+	+
244	♂♂♀	32	146	39	122	+++	—
250	♂♀	37	85	81	122	++++	+++
5	♂♀	51	165	24	127	++	+
273	♂♀♀	20	114	75	138	+++	++
275	♀♀	27	170	93	128	++	++
252	♀♀	40	116	30	136	+++	—
266	♂♂	54	280	21	157	++++	+++
272	♂♂	24	237	32	157	—	—
300	♂♂♀	43	280	—	151	+++	++
10	♂♀	53	127	45	197	+++	+++
277	♂♀♀	34	257	—	207	++	++
278	♀♀	42	87	35	207	+++	+
279	♀♀	38	95	20	207	+++	++
280	♂♀	286	213	—	209	+	—
260	♂♀	43	153	50	376	++++	+++
371	♂♂	31	183	31	271	+++	++
301	♂♂	365	230	—	260	++++	+++
393	♂♀	228	180	136	235	++++	+++
788	♂♂	285	209	201	242	+++	—
799	♂	296	213	—	245	++	—

rding to the above results, animals fed on a vitamin A deficient diet for riod develop calculi; bladder stones are formed in a relatively short period, tones later and bile-duct stones last of all.

Thirty young so-called Chinese mice weighing 8 to 14 grams were fed on iin A deficient diet for from two to 295 days. The majority of them showed is of xerophthalmia within 25 days and most of them died a few days order to maintain life, I gave the survivors occasionally a vitamin A rich l proceeded with the experiment.

nty-one out of 30 mice died within 31 days, none having calculi; four re kept 58 to 65 days and two cases (50 %) of bladder stone were found, e were no other stones; three mice were kept 112 to 121 days and all had stones (100 %), one had kidney stones (33 %), but there were no bile-duct ne mouse lived for 295 days, and it was found to have bladder, kidney -duct stones.

results are shown in the following table (21 rats died within 31 days, and included in the table):

Sexe Sex	Poids Body weight		Apparition de la xérophtalmie Symptom of xerophthalmia appears	Durée du régime Duration of feeding	Calculs — Calculi		
	Début de l'expérience Beginning of experiment	Fin de l'expérience End of experiment			Vessie Bladder	Rein Kidney	Voies biliaires Bile duct
	gr. — gms.	gr. — gms.	Jours — Days	Jours — Days			
♀	11	10	—	32	—	—	—
♂	10	12	25	58	+	—	—
♀	10	11	—	59	—	—	—
♂	8	9	20	62	+	—	—
♀	10	9	12	65	—	—	—
♀	10	8	—	112	+	—	—
♂	10	13	25	116	++	+	—
♂	12	12	18	121	+	—	—
♂	7	21	280	295	++++	+++	++++

the case of Chinese mice also, the concretions are not found among animals ly for a short period, but are found among animals kept for a long period. e animals, too, bladder stones were the earliest to form, then kidney stones, et stones taking the longest time.

Five puppies of the same litter, about 40 days old and weighing 1,200 to rams, and also an 18-months-old dog weighing 10,511 grams, were fed on iin A free diet for from nine to 101 days. The diet consisted of:

	%
Polished rice (dry)	71
Casein	12
Olive oil	10
Salt mixture	5
Dried bottom yeast	2
Daikon juice	30 to 50 c.c. per day.

The dried polished rice was cooked and casein, olive oil, salt mixt yeast and daikon juice were added to it.

Five of the dogs were either dead or were killed within 71 days, bu them had any calculi, although one of the dogs showed symptoms of xero within 40 days. One puppy lived for 101 days and was found to have bot and kidney stones.

Experiment II. — Rats fed on Vitamin A and C Deficient Diet.

One hundred and seventy-eight albino rats weighing 30 to 40 gram them were well grown) were fed on a vitamin A and C deficient diet fo 238 days. The diet was composed of:

	%
Dextrin	65
Casein	18
Olive oil	10
Salt mixture	5
Dried bottom yeast	2

Seventy-nine out of 178 rats were dead within 30 days, but had n among 16 rats kept for 31 to 40 days there were two cases (12 per cent) o stones only; among 30 rats kept for 41 to 50 days five (17 per cent) wit stones were found, but no other stones; 27 rats were kept for 51 to 80 days (33 per cent) had bladder stones and two (7 per cent) had kidney stones, were no bile-duct stones; eight rats were fed for 71 to 100 days and five cent) had bladder stones and two (25 per cent) had kidney stones, but t no bile-duct stones; eight rats were fed for 101 to 122 days and six (75 had bladder stones, four (50 per cent) had kidney stones and two (25 per bile-duct stones; four rats were kept for 141 to 200 days and all (100 per bladder stones, three (75 per cent) had both kidney and bile-duct stones; were kept for over 207 days and all (100 per cent) had bladder stones, both kidney and bile-duct stones. The following table shows the result surviving more than 30 days:

N° de l'animal No. of animal	Sexe Sex	Poids — Body weight		Apparition de la xéroph-talmie Symptom of xeroph-thalmia appears	Durée du régime Duration of feeding	Calculs — Ca	
		Début de l'expér. Beginning of experiment	Fin de l'expér. End of experiment			Vessie Bladder	Rein Kidney
		gr. — gms.	gr. — gms.	Jours — Days	Jours — Days		
2	♂	41	87	—	31	—	—
4	♂	41	49	4	31	+	—
5	♂	30	81	—	31	—	—
6	♂	26	46	—	31	—	—
7	♂	27	64	25	31	—	—
8	♂	41	112	—	31	—	—
13	♂	28	80	—	31	—	—
14	♀	29	83	—	31	—	—
15	♀	21	65	—	31	—	—
18	♀	30	69	—	31	—	—

Sexe Sex	Poids — Body weight		Apparition de la xérophtalmie	Durée du régime	Calculs — Calculi		
	Début de l'expér. Beginning of experiment	Fin de l'expér. End of experiment	Symptom of xerophthalmia appears	Duration of feeding	Vessie Bladder	Rein Kidney	Voies biliaires Bile duct
	gr. — gms.	gr. — gms.	Jours — Days	Jours — Days			
♀	48	110	—	39	—	—	—
♀	31	70	—	31	—	—	—
♂	20	49	—	35	—	—	—
♀	26	53	—	35	—	—	—
♀	17	45	—	35	—	—	—
♂	40	66	21	35	+	—	—
♂	26	50	—	45	—	—	—
♂	35	67	35	45	+	—	—
♂	26	39	29	42	+	—	—
♂	31	77	—	42	—	—	—
♂	24	33	—	41	—	—	—
♂	24	45	—	43	—	—	—
♂	23	64	42	49	—	—	—
♂	35	51	—	42	—	—	—
♀	23	28	29	42	—	—	—
♀	25	56	34	49	+	—	—
♀	28	55	34	49	—	—	—
♀	29	100	—	45	—	—	—
♀	25	50	—	44	—	—	—
♀	39	61	—	42	—	—	—
♀	20	49	35	49	—	—	—
♀	36	58	—	45	—	—	—
♂	26	79	28	49	+	—	—
♂	30	80	—	48	—	—	—
♀	33	63	38	49	—	—	—
♂	41	87	—	49	—	—	—
♂	23	67	—	48	—	—	—
♀	43	98	14	42	+	—	—
♀	47	105	35	49	—	—	—
♀	32	44	16	48	—	—	—
♀	34	69	20	49	—	—	—
♀	46	69	42	43	—	—	—
♀	36	49	28	43	—	—	—
♀	50	101	29	42	—	—	—
♀	40	84	—	42	—	—	—
♀	41	79	28	47	—	—	—
♀	24	42	35	56	—	—	—
♀	26	56	35	56	—	—	—
♀	22	49	35	55	—	—	—
♀	26	66	35	57	+++	—	—
♂	25	69	45	56	—	—	—
♂	38	65	49	53	—	—	—
♂	25	51	48	56	+	—	—
♂	26	72	49	55	—	—	—

N° de l'animal No. of animal	Sexe Sex	Poids — Body weight		Apparition de la xérophtalmie Symptom of xerophthalmia appears	Durée du régime Duration of feeding	Calculs — Cal	
		Début de l'expér. Beginning of experiment	Fin de l'expér. End of experiment			Vessie Bladder	Rein Kidney
		gr. — gms.	gr. — gms.	Jours — Days	Jours — Days		
91	♀	28	80	48	56	—	—
92	♀♀	42	92	47	58	+	—
94	♀♀	35	94	49	56	+	—
103	♂♀	19	101	42	56	+	—
108	♂♀	25	82	—	54	—	—
122	♂♀	24	101	—	60	—	—
123	♂♀	34	196	—	59	—	—
73	♀♀♀	49	60	45	63	+	—
79	♀♀	37	70	48	70	—	—
129	♂♀	35	80	42	70	+	—
202	♂♀	24	103	35	61	—	—
205	♂♀	30	62	35	61	+	+
206	♂♀	32	72	39	61	+	+
218	♂♀	42	116	49	61	—	—
220	♂♀	37	115	—	61	—	—
77	♂♂	21	82	49	79	—	—
84	♂♂	27	130	53	77	—	—
110	♂♀♀	37	105	49	71	—	—
114	♂♀♀	26	104	55	77	—	—
1	♂♂	30	108	59	89	—	—
3	♂♂	37	89	45	89	—	—
27	♂♀♀♀	35	89	42	89	++	+
74	♂♀♀	32	61	70	88	+	—
76	♂♀♀	36	79	56	84	+	—
117	♂♀♀	30	172	—	84	—	—
226	♂♀♀	25	65	40	90	+	+
237	♂♂♂	39	85	67	94	+++	—
254	♂♂♂	41	120	39	115	—	—
255	♂♂♂	40	111	43	101	+++	—
257	♂♂♂	52	139	42	112	+++	+++
247	♂♂♀	37	129	39	115	++++	+++
248	♂♂♀	37	124	32	109	+++	++++
119	♂♂♀	37	165	112	121	++	—
231	♂♂♀	187	163	79	122	—	—
268	♂♂♂	50	122	52	122	+++	+++
230	♂♂♂	214	139	83	141	++	+
23	♂♂♂	25	171	92	154	+++	++
256	♂♂♀	35	161	49	163	++++	—
261	♂♂♀	32	147	39	171	+++	++
246	♂♂♀	39	95	26	210	++++	++++
249	♂♂♂	32	132	30	238	++++	++++
251	♂♂♂	40	125	63	238	+++	+++
245	♂♂♀	30	93	46	207	++++	++++
276	♂	26	247	—	207	+++	—

hese experiments, too, bladder stones were found in a relatively short
ıen kidney stones next, bile-duct stones taking the longest time.

Experiment III. — Rats fed on Vitamin B Deficient Diet.

y-eight albino rats weighing 22 to 81 grams were fed on a vitamin B free
e diet was composed as follows:

	%
Dextrin	65
Casein	20
Olive oil	7
Cod-liver oil	3
Salt mixture	5

les these materials I gave daikon juice.
out of 38 rats died within 29 days and 10 more died in 31 to 66 days; the
ft were occasionally supplied with dried yeast in order to keep them alive,
died within 90 days, 10 lived from 103 to 122 days and four lived over
; none of them had calculi.
ı these results, I can safely conclude that vitamin B has nothing to do
formation of concretions.

Experiment IV. — Rats fed on Vitamin C Deficient Diet.

y-six albino rats weighing 18 to 45 grams were fed on a vitamin C free diet
283 days and examined for concretions. The food consisted of:

	%
Dextrin	65
Casein	18
Olive oil	7
Cod-liver oil	3
Salt mixture	5
Dried bottom yeast	2

well known that albino rats grow well without vitamin C. In this experi-
ıe rats grew normally and the final average weight of the males was 312
ıd of the females 195 grams (animals fed for over six months).
ɔng these animals I found no calculi except in one case. This rat showed
ıs of xerophthalmia on the 78th day of the experiment, but the symptoms
red within a week and it again showed xerophthalmia on the 92nd day;
o weeks it recovered and lived for 150 days.

Experiment V. — Rats fed on Vitamin B and C Deficient Diet.

nty-seven albino rats weighing 20 to 75 grams were fed on a vitamin B
ee diet for 4 to 169 days.
food consisted of:

	%
Dextrin	65
Casein	20
Olive oil	7
Cod-liver oil	3
Salt mixture	5

Eight out of 27 rats died within a week but the other 19 rats lived for 169 days. The growth and appearance of these rats were just the same as case of Experiment III (vitamin B deficient diet). Five rats survived for 169 days, but showed no calculi.

From these experimental results, it seems to me that vitamin B and nothing to do with the formation of calculi.

Experiment VI. — Rats kept on a Normal Diet.

Twenty-six albino rats weighing 29 to 57 grams were fed on a norma which was composed of:

	%
Dextrin	65
Casein	18
Olive oil	7
Cod-liver oil	3
Salt mixture	5
Dried bottom yeast	2

Besides these, daikon juice was given freely.

The duration of the experiment was 56 to 356 days; all the rats grew w attained the normal weight and no calculi were found.

The bladder stones observed in animals fed on vitamin A or vitamin A deficient diet varied in size from particles no larger than grains of sand to as big as large beans; some of them were hard, others not so hard. The nur stones varied from one to 150 or more. The stones were situated in the k and also in the prostate gland. Some of them were smooth, others had rou uneven surfaces and some were covered with spikes. The colour varied dirty white to a pale yellow or a dark brown. The dark-brown colour was surface only and the inside was either dirty white or pale yellow; when I foun brown stones I usually noticed the bladder full of blood.

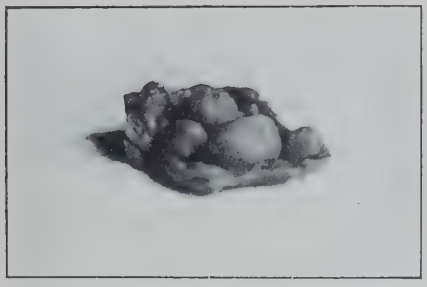
The kidney stones varied in size and in shape from that of a grain of millet to that of a red bean. Some of them were fairly smooth and pyramid shape, while others were uneven and rock-like. The colour was the same as bladder stones. The number varied from two or three to 20 or more.

The bile-duct calculi varied in size from that of the head of a pin to that bean. Some of them were uneven and some smooth and rather soft. The varied from one or two to 40 or more. Their colour was the colour of bile. bile-duct stones are formed, the orifice of the bile duct becomes closed and cases the ducts become enlarged to the size of a small lead pencil.

Repeated chemical examination of the urinary stones showed that they co mainly of phosphate of calcium and magnesium and triple phosphate, with tr sodium, potassium and a small amount of mucoid substance. For example, bladder stone I found 55.7 per cent of P_2O_5 (calculated from dried sample bile-duct stones were found to consist mainly of cholesterol and pigment.

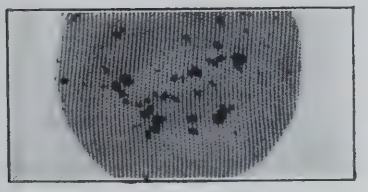
Summary.

(1) Animals kept on a vitamin B deficient diet did not develop calculi.
(2) Animals kept on a vitamin C deficient diet did not develop calculi.
(3) Animals kept on a vitamin B and C deficient diet did not develop
(4) Animals kept on a normal diet did not develop calculi.
(5) Animals kept on a vitamin A deficient diet for a short time did not calculi.



Bladder Stones (taken from white rats)

Kidney Stones (taken from a white rat).



Bile-duct Stones (taken from white rats).

) Animals fed on a vitamin A and C deficient diet for a short time did not
p calculi.
) Animals kept on a vitamin A deficient diet for a long period formed calculi.
r stones were formed in a relatively short period, next kidney stones, while
ict stones took the longest time to form.
) Animals kept on a vitamin A and C deficient diet for a long period formed
. In this case, too, bladder stones were formed in a relatively short period,
idney stones, while bile-duct stones took the longest time to form.
) The urinary calculi were phosphatic calculi.
0) The biliary calculi were cholesterol stones.

Treatment for Experimental Calculi.

ats fed on the vitamin A deficient diet, and vitamin A and C deficient diet,
xamined for the presence of calculi by X-rays; six rats were selected, in which
bladder stones were found. Their diet was changed to a vitamin A rich diet
ting of:

	%
Dextrin	65
Casein	18
Olive oil	7
Cod-liver oil	3
Salt mixture	5
Dried bottom yeast	2

Daikon juice *ad libitum.*

esides this diet I gave daily about 2 grams of dried river lamprey *(Entosphemis
icus)*, although the animals took only 1 to 1½ gram a day. (According to
vestigations dried river lamprey is very rich in vitamin A. 0.1 gram of dried
lamprey daily was sufficient to cure xerophthalmia in albino rats.) After the
diet was supplied the physiological condition of the animals was greatly
ved and became almost normal.

One rat was kept on a vitamin A rich diet for two and a-half months and then
and examined for calculi. Four of the bladder calculi had disappeared and
ll one was left; this stone's edges were smooth and presented a number of smooth
suggesting that it was disappearing. Three rats were kept on the same diet
ree months and killed; no calculi were found, though in one case a soft cartilage-
ubstance was present. Two rats were kept for four and a-half months and
; no stones were found.

One of the reasons why the bladder stones disappeared was probably that the
had changed to an acid from an alkaline reaction. It was found that, in the
f the rats fed on the vitamin A or vitamin A and C deficient diet, the urine
ed to an alkaline reaction.

The author takes this opportunity of expressing his indebtedness to Dr. Tadasu
Director of the Imperial State Institute for Nutrition, for his encourage-
in this work and for much valuable advice during its progress. He also wishes
ly to thank Messrs. H. Matsumuro and Y. Shimoda for their valuable assistance
ghout the experiments.

II.

In the first report I discussed the formation of phosphatic and cholesterol
tions in animals kept on vitamin A and also vitamin A and C deficient diets

for a long period. In the following experiments I attempted to find out the inf of protein and inorganic phosphorus and calcium on the formation of the and also the chemical nature of the concretions.

Experiment I. — Animals fed on the Protein and Vitamin A Deficient Die

Twenty albino rats weighing 24 to 35 grams were fed on the following p and vitamin A deficient diet for three to 103 days:

	%
Dextrin	83
Olive oil	10
Salt mixture	5
Dried bottom yeast	2

Daikon juice *ad libitum*.

(In this diet there is 2 per cent of dried bottom yeast and therefore 1.4 pe of protein.)

Fourteen rats died within a month; there were two cases (14 per cent) of b stones but no other stones were found.

Six rats died within 31 to 103 days; there were two cases (33 per cent) of b stones and one case (16 per cent) of bile-duct stones, but no kidney stones were

Chemical analysis showed that the urinary stones consisted of phos and a protein-like substance.

Experiment II. — Rats fed on the Protein Deficient Diet.

Twenty albino rats weighing from 24 to 137 grams were fed on the p deficient diet for three to 101 days. The food consisted of:

	%
Dextrin	83
Olive oil	7
Cod-liver oil	3
Salt mixture	5
Dried bottom yeast	2

Daikon juice *ad libitum*.

(In this diet there are 2 per cent of dried bottom yeast and therefore 1 cent of protein.)

Eighteen out of 20 rats died in three to 47 days and the other two live days and 101 days respectively, but no calculi were found.

Experiment III. — Rats fed on the Vitamin A and Inorganic Calcium and Phosphorus Deficient Diet.

Twenty albino rats weighing from 24 to 60 grams were kept on the vita and inorganic calcium and phosphorus deficient diet for seven to 64 days. Th was composed of :

	%
Dextrin	68.85
Casein	18.00
Olive oil	10.00
Dried bottom yeast	2.00
Salt mixture	1.15

Daikon juice *ad libitum*.

he salt mixture consisted of:

	%
NaCl	7
$MgSO_4H_2O$	13
Fe-citrate.	3
Trace of KI.	

eventeen out of 25 rats died within 30 days and among them one case (6 per of bladder and kidney stones and two cases (12 per cent) of bile-duct stones found. The other eight rats lived for 31 to 64 days; among them six cases r cent) of bladder and bile-duct stones and four cases (50 per cent) of kidney were found.

he formation of calculi is shown in the following table (rats fed over 30 days).

e ıal of al	Sexe Sex	Poids Body weight: Début de l'expérience Beginning of experiment gr. — gms.	Poids Body weight: Fin de l'expérience End of experiment gr. — gms.	Apparition de la xérophtalmie Symptom of xerophthalmia Jours — Days	Durée du régime Duration of feeding Jours — Days	Calculs — Calculi: Vessie Bladder	Calculs — Calculi: Rein Kidney	Calculs — Calculi: Voies biliaires Bile duct
	♂	60	51	28	42	++++	+++	++++
	♂	60	83	29	64	—	—	+++
	♀	51	60	27	46	++	++	+++
	♀	37	42	28	44	++++	++++	+++
	♀	54	63	35	40	++++	—	—
	♀	43	61	28	49	—	—	—
	♂	46	61	35	52	+++	—	+++
	♂	59	60	30	60	++++	++++	++++

s shown in the table, bile-duct stones were formed in a rather shorter time bladder stones, and kidney stones were formed last of all.

he urinary calculi found in the animals fed on the vitamin A and inorganic m and phosphorus deficient diet consisted mainly of carbonate; the bile-duct s consisted of an abundance of calcium salts together with cholesterol and ent.

Summary.

1) Animals kept on the protein and vitamin A deficient diet formed concre- is a relatively short period (shorter period than those fed on either the vitamin icient or the vitamin A and C deficient diets).

2) Animals fed on the protein deficient diet did not form calculi.

3) Animals fed on the vitamin A and inorganic P and Ca deficient diet formed i in a very short time. In these cases bile-duct stones were formed first and bladder stones, kidney stones taking the longest time of all.

4) The urinary calculi found among the animals fed on the vitamin A and anic P and Ca deficient diets were carbonate calculi, while the calculi of the ls fed on the vitamin A and vitamin A and C deficient diets were phosphatic. ile-duct calculi consisted of abundant calcium salts with cholesterol and pigment.

22.

FORMATION OF GASTRIC CARCINOMA N ALBINO RATS FED ON DEFICIENT DIETS.

By Yoshitomo Fujimaki

(From the Imperial State Institute for Nutrition, Tokyo).

lthough a number of investigators have been working on deficiency diseases, not yet heard of the production of carcinoma in albino rats by feeding them iets deficient in vitamin A.

he constituents of the diet and the methods of feeding used at the Imperial Institute for Nutrition are different from others. We have paid special on to the purification of the food materials in order to eliminate all vitamins as possible; we have also paid special attention to the combination and pro- n of food materials (such as casein, dextrin, olive oil, salt mixture and dried n yeast). In order that young rats might survive for a long period, they were a diet rich in vitamin A whenever symptoms of xerophthalmia appeared, en they became weak.

ne rats so treated developed carcinoma, which is not ordinarily observed hey are fed continuously on a vitamin A deficient diet. If the above proce- not carried out, the young rats do not survive long enough for the formation inoma. Well-grown rats, on the other hand, do occasionally survive long n for carcinoma to form.

uring autopsies on animals fed for long periods on vitamin A deficient or poor recognised special changes in the stomach. I noticed especially a circumscribed ning with multiple scattered ulcers. I showed and explained these results ector Saiki; we exchanged opinions concerning them and I then continued periments very carefully.

n March 17th, 1925, I found what appeared to be a tumour; this was macro- lly examined and diagnosed as carcinoma. The histological work was done Kimura and his assistant Dr. Wada, of Jikeikwai Medical College. The author to take this opportunity of expressing his appreciation of their kind assistance. preliminary report was presented by Fujimaki and Masaki at the fifteenth g of the Imperial State Institute for Nutrition on June 11th, 1925.

ne following experiments were performed to show the relationship between rmation of cancer and nutrition.

Preparations for the Experiments.

1. *Diet for Experimental Animals.*

ne diet must contain all the necessary nutritive elements except those being gated and must be adequate to supply the necessary energy; it must also be

digestible and palatable. By the term " perfect diet " we mean a diet which cont an adequate amount of protein, carbohydrate, fat, mineral salts and vitam However, before we prepare a diet with these materials, they must be purified. I a great deal of attention to the purification, using the following procedures:

(a) *Casein used as a source of protein.*

Seven or eight pounds of casein were boiled for five or six hours with two to t times its volume of 90 to 95% alcohol on a water bath, using a reflex condense prevent the evaporation of alcohol. During the extraction the casein was sti constantly by a motor. The mixture was filtered with a suction pump and casein was well washed with alcohol. This procedure was repeated from tw three times, after which the casein was dried and ground to a powder.

(b) *Dextrin used as a source of carbohydrate.*

Dextrin was treated in exactly the same way as casein.

(c) *Olive oil used as a source of fat.*

According to some authorities, olive oil does not contain vitamin A; I am convinced of the truth of this statement. In my work it was used merely as a so of fat, and, in order to eliminate any vitamin A, I heated the oil twice to 160 170° C. for several hours each time. During the heating the oil was sti continuously.

(*d*) I obtained bottom yeast from a brewing company, added a large amou cold tap water, stirred well and then let it stand for several minutes till the y precipitated. The yeast was then washed all night and the hops were strained o means of a silk sieve. The yeast was compressed and dried by an air dryer, ground to a powder.

2. *Composition of Food Mixture.*

The foods furnished to the experimental rats consisted of isolated food mate purified by the above methods; they were mixed in the following proportions:

(*a*) Vitamin A deficient diet:

	%
Dextrin	65
Casein	18
Olive oil	10
Yeast	2
Salt mixture	5

The salt mixture was composed of the following salts:

	%
NaCl	6.5
$MgSO_4H_2O$	13.0
$NaHPO_4H_2O$	10.0
$K_2HPO_4H_2O$	30.0
Ca-lactate	37.0
Fe-citrate	3.0

A trace of KI.

b) Vitamin A and protein deficient diet:

	%
Dextrin	83
Olive oil	10
Salt mixture	5
Yeast	2

The salt mixture was the same as in (*a*).
In this diet there was 2 per cent of dried bottom yeast and therefore 1.4 per cent protein.

c) Vitamin A and inorganic calcium and phosphorus deficient diet:

	%
Dextrin	68
Casein	18
Olive oil	10
Yeast	2
Salt mixture	2

The salt mixture was composed of the following salts:

	%
NaCl	7
$MgSO_4H_2O$	13
Fe-citrate	3

A trace of KI.

d) Normal diet:

	%
Dextrin	67
Casein	18
Olive oil	7
Cod-liver oil	3
Salt mixture	5

Daikon or its juice *ad libitum*.

The salt mixture was the same as in (*a*).

Selection of Animals and Feeding.

For these experiments I selected young and well-grown albino rats. The young do not survive long on the diets mentioned above; therefore I fed them occasionally with a normal diet in order to keep them alive. Most of the well-grown rats lived for a long time, though some did not survive longer than two months. Occasionally one of the well-grown rats would become weak and show symptoms of ophthalmia; it was then given the normal diet, which improved its physical condition, and I again fed it with the deficient diet mentioned above.

The duration of the feeding of the rats with the vitamin A deficient diet was from one to twelve months, with the vitamin A and protein deficient diet from one to four months, and with the diet deficient in inorganic calcium, phosphorus and vitamin A from two to five months. Each rat was kept in a separate and clean cage.

The foods were changed four times a week, each rat being given a freshly prepared diet. The body weight was taken twice a week at a definite time.

Pathological Changes.

1. *Macroscopical Observations.*

Here I will summarise the pathological changes found in the stomachs. Qu frequently there were hæmorrhages, and the stomach was often full of blood. In fore-stomach I frequently found pale greyish circumscribed thickenings; there mi be two or three, or even twenty or more, and they were the size of grains of Ital millet or frequently as large as green peas. The centre of these circumscri thickenings was sunken or concave. At the junction of the fore-stomach and m stomach were frequently recognised papillomata and islands of tissue showing unusual thickening. In the main stomach, I often found dark pinkish circumscri concave masses varying in number from one or two to fifty or even more. Sev of the stomachs were full of growth.

2. *Microscopical Observations.*

To supplement the results of macroscopic examination, microscopical exami tions were made by Professor Tetsuji Kimura, of Jikeikwai Medical College. author wishes to take this opportunity of expressing his appreciation of his kind

In some specimens there were slight changes indicating a keratinising proc while in others a definite hyperkeratosis was observed. In the upper layers of cells were observed intensive growths of connective tissue and epithelium wh were either of an atypical or papillomatous form, or represented a heterotyp growth of the germinal layer. Some of these extended into the sub-mucosa the muscular layer in this region was atrophied.

From the above observations I draw these conclusions: carcinoma or carcino tosis begins as a hyperkeratosis which goes on to papilloma formation; heterotyp extension then occurs and finally there is a conspicuous destructive extension of growth which appears to be cancerous transformation.

In experimental carcinoma we must consider two different causes: (1) a con tutional cause, (2) a local cause.

Up to the present time, experimental cancer or tumour has been always thou of as the result of some local irritation; for instance, Fibiger produced experime gastric carcinoma by local irritation, using a parasite called *Speroptera neoplas* or *gongyloma neoplasticum*; Professors Yamagiwa and Ichikawa produced cance a rabbit's ear by smearing it with coal tar. Other investigators have perfor similar experiments with like results; in all, the main stress has been laid on l irritation as the cause, and constitutional causes have usually been neglected.

Fibiger was the first man to produce experimental cancer in the stomach white rats, and many investigators have since produced cancer or tumour- growths in these animals. However, all these growths resulted from local irrita acting for a long time; a chronic hyperplastic inflammation first took place, wh later became a malignant or non-malignant tumour. In my experiments the stage of inflammation, which is found when cancer results from local irritation, not present, but the last stages were similar and cancer was eventually produ However, in the last stage some inflammation may be found.

In conclusion, the reasons why we claim that there is a definite relation between the vitamin A free diet and the pathological changes of the stomach ar follows:

1. Rats fed on a normal diet have been found by all investigators t usually free from either a keratinising process or tumour formation, but w

iven the deficiency diets mentioned above we almost always found in them keratinising process and frequently carcinoma.

2. During the experimental periods, I did not initiate any local irritation ther mechanically or chemically.

3. When rats were fed with a vitamin A free diet, the various epithelia ere transformed into stratified squamous keratinising epithelium; this process as already been described by various workers as occurring in the eye-ball, oral avity, nasal passage, larynx, trachea and bronchi, pancreas, renal pelvis, eminal vessels, epididymis, prostate gland, ovaries, oviducts and uterus. In me of the above organs I have observed carcinoma macroscopically.

rom the above results, I conclude that a vitamin A free diet has a definite nship with the formation of carcinoma.

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SUR LE TITRAGE

(STANDARDISATION)

DES TUBERCULINES

PAR

le Prof. **A. CALMETTE** et le Dr **DE POTTER**

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(*C. H. 429.*)
Genève, Avril 1926

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SUR LE TITRAGE (STANDARDISATION) DES TUBERCULINES

Lors de sa réunion d'octobre 1924, le Comité d'Hygiène de Société des Nations a décidé d'instituer, sous la présidence u Dr Tsurumi, une Commission dans le but :

1° D'étudier les méthodes mises en pratique dans les divers boratoires pour mesurer l'activité des tuberculines ;

2° De comparer les résultats qu'elles fournissent ;

3° D'établir si, en l'état actuel de nos connaissances, il est ossible de recommander le choix de l'une d'elles comme éthode de *standardisation* ou de *titrage*.

Pour lui permettre de remplir sa tâche, cette Commission ous a priés d'entreprendre les expériences que nous estimeons utiles et de lui en faire connaître les conclusions. C'est bjet essentiel du présent travail.

Il était entendu que nous devions limiter notre enquête et os recherches à la *vieille tuberculine* (O. T.) ou *tuberculine ute de Robert Koch*.

Nous avons tout d'abord rédigé un questionnaire dont on ouvera ci-après le texte (*Annexe A.*) et que la Section Hygiène de la Société des Nations s'est chargée d'adresser ux laboratoires officiellement connus comme préparant des berculines pour l'usage vétérinaire (*Annexe B.*). Leurs obli-antes réponses nous ont été aussitôt transmises et nous commencerons par en résumer brièvement la substance.

A. — Préparation de la tuberculine (O. T.).

1° Races de bacilles utilisés. — Ce choix a une grande mportance, car l'activité d'une tuberculine dépend en partie de rigine des souches microbiennes employées et, bien que la

fonction tuberculinique ne soit pas toujours en rapport étro avec la virulence, il semble que les bacilles avirulents ou pe virulents soient de médiocres producteurs de tuberculine.

La plupart des Instituts utilisent des mélanges de cultures d bacilles bovins et de bacilles humains. Toutefois, ceux qui n préparent que des tuberculines destinées à la médecine vétér naire se servent exclusivement de bacilles bovins, et quelqu autres préparent, en partant de souches de tuberculo humaine, des tuberculines réservées à l'usage humain.

Les cultures aviaires sont habituellement écartées, sauf pou l'obtention de tuberculines *aviaires* ou *mixtes* qui servent déceler la tuberculose aviaire chez les oiseaux de basse-cour chez certains mammifères susceptibles d'être infectés par bacille aviaire, tels que le cheval, le porc.

L'expérience déjà ancienne des réactions tuberculiniqu montre que, chez l'homme, et particulièrement chez les jeun enfants, les tuberculines humaines et bovines donnent d résultats sensiblement équivalents. Il est donc recommandab d'utiliser, pour la préparation de la tuberculine destinée l'usage humain, des mélanges en parties égales de cultur d'origine humaine et d'origine bovine.

2° Composition du milieu de culture. Son *p*H initial. — Quelqu Instituts sont restés fidèles au milieu de culture primitivem employé par Robert Koch (bouillon de bœuf légèrement al linisé, contenant 10 grammes de peptone et 40 à 50 gramm de glycérine par litre). Mais cette composition a été notab ment modifiée par beaucoup d'autres, dans le but d'obtenir cultures plus riches et plus rapides.

Les uns ont adopté le bouillon de veau additionné de 1 p. de peptone, de 0,5 p. 100 de NaCl et de 4 ou 5 p. 100 de gly rine avec un *p*H initial allant de 7 à 7,8.

D'autres (*Ottawa*) ajoutent 1 p. 100 de glucose à une sim infusion de viande de bœuf ou de veau peptonée et glycéri ayant un *p*H de 8.

Le *laboratoire bactériologique de l'Etat*, à Stockh emploie un bouillon contenant 3 p. 1.000 de NaCl, 10 p. 1 de peptone, 30 p. 1.000 de glycérine et 4 p. 1.000 de phosp de sodium, avec un *p*H de 6,7 à 6,9.

L'*Institut sérothérapique d'Ivanovice* se sert de bouillon de œuf glycériné à 9 p. 100 avec un *p*H de 7,2 à 7,5. A l'*Institut 'Hygiène expérimentale de Montevideo*, on fait macérer pen- ant vingt-quatre heures, dans le bouillon de bœuf peptoné et lycériné, des pommes de terre hachées.

La viande de cheval est préférée par les *Behringswerke* de larburg (1 kilogramme pour 4 kilogrammes d'eau, 3 p. 100 de lycérine, 0,5 de NaCl et 1 p. 100 de peptone; le *p*H est de 7,1 à .2), et aussi par le *Lister Institute* de Londres, qui lui fait subir ne digestion trypsique préalable (*p*H : 7,8).

Enfin chez *Merck*, à Darmstadt, on prépare un bouillon de H : 6,6 avec de l'extrait de viande, et le laboratoire *Bruschettini*, le Gênes, utilise, outre le bouillon de viande glycériné, un ilieu à l'œuf analogue à celui de Besredka.

Il est fort difficile de porter un jugement sur l'opportunité de loutes ces variantes. La plupart ne paraissent pas justifiées. Nous sommes nettement d'avis que le milieu le plus favorable au développement rapide des voiles et à la production de la tuberculine est le bouillon de veau additionné de 1 p. 100 de peptone, 0,5 p. 100 de NaCl, 5 p. 100 de glycérine et ayant, avant stérilisation, un *p*H de 7,2. Certains milieux synthétiques, principalement celui de *Sauton*, sont excellents pour l'obtention de cultures abondantes en corps microbiens, mais ils fournissent constamment une tuberculine moins active que les bouillons de viande peptonés.

3° Age des cultures. — La durée du séjour des cultures dans une étuve bien réglée à 38° C. exerce une influence manifeste sur leur richesse en tuberculine. Tous les laboratoires sont d'accord pour admettre qu'elle ne doit pas être de moins de quatre semaines. Le plus grand nombre la prolonge jusqu'à six à huit semaines. Quelques-uns (*Kharkoff*, *Ottawa*, *Bucarest*, *Ivanovice*) jusqu'à douze et même vingt-quatre semaines (*Burrough et Wellcome*, *Merck*, *Behringswerke*). Il ne semble pas que cette longue incubation augmente sensiblement la richesse des cultures en principes actifs.

4° Mode de stérilisation des cultures. — Avant d'être mises en œuvre pour la préparation des tuberculines, les cultures sont

généralement tuées par trente à soixante minutes de chauffag à 100°. Dans certains Instituts (*Kitasato*), on préfère ne pa dépasser la température de 90° ou même de 80° maintenu pendant plusieurs heures (*Leeuwarden*). D'autres ne craigner pas de prolonger le chauffage jusqu'à trois heures à 104° (*Inst tut sérothérapeutique de Vienne, d'Ottawa*). Quelques-uns sup priment complètement le chauffage (*Evan Sons, Lescher Webb, Institut Oswaldo Cruz, Stockholm, laboratoire Wele minsky*) et filtrent directement sur bougies Berkefeld.

5° Modes de filtration et de concentration. — Beaucoup d laboratoires (17 sur 34) procèdent d'abord à la concentratio des cultures par évaporation au bain-marie jusqu'à réduction 1/10 de leur volume primitif. Celles-ci sont ensuite filtrées soit sur papier, soit sur bougies, soit en premier lieu su papier, puis sur bougies.

Certains préfèrent filtrer avant de procéder à la concentra tion (*Ottawa, Graz, Rotterdam, Prague, Cracovie, Stockholm Bruschettini, Duncan, Lister, Wellcome*).

La filtration est, le plus souvent (25 sur 34), effectuée su papier. Trois Instituts emploient exclusivement les bougie Chamberland, Berkefeld ou Mandler. Au laboratoire du *Com monwealth, de Melbourne*, on utilise le filtre type Buchner constitué par deux couches de papier-filtre, une couche d'ouat et deux autres couches de papier-filtre.

A *Bucarest*, les cultures ne sont ni filtrées, ni concentrées mais seulement décantées après sédimentation prolongée pen dant quinze à vingt jours, puis mises immédiatement en ampoules.

La technique qui consiste à évaporer sans trop de hâte les cultures au bain-marie aux environs de 100° pour favoriser au maximum l'extraction des endotoxines bacillaires par la con centration progressive de la glycérine, puis à filtrer simple ment sur papier épais (papier Chardin), nous paraît incontesta blement la meilleure.

6° Modes de conservation des tuberculines concentrées. — Les produits bruts obtenus après concentration et filtration sont ordinairement emmagasinés ou délivrés immédiatement

s qu'il soit nécessaire de les stériliser de nouveau. Cepen-
t, quelques Instituts préfèrent leur faire subir, après réparti-
en ampoules, un chauffage à 60° (*Stockholm*), à 100°
awa), ou même à 110-120° (*Ivanovice*). Chez le professeur
sato, à Tokio, le liquide filtré est aussitôt additionné de
p. 100 d'acide phénique.

° Formes sous lesquelles les tuberculines sont délivrées. —
ans les laboratoires où les tuberculines sont préparées avec
mélanges de cultures bovines et humaines, ces mélanges
t généralement effectués *après concentration* et en propor-
s très variables : tantôt 2/3 de cultures d'origine humaine
r 1/3 de bovine (Behringswerke, de Marbourg); tantôt 3/4
ovine et 1/4 d'humaine (Institut Pasteur de Paris).
e plus souvent, les tuberculines sont délivrées sur la
ande des médecins et des vétérinaires, soit sous la forme
te, concentrée, soit diluées et prêtes à l'usage. Le taux de la
tion, habituellement faite dans l'eau phéniquée à 0.5 p. 100,
variable; celle de 1 partie de tuberculine pour 9 d'eau phé-
iée est la plus communément demandée. Mais, pour l'usage
lical, beaucoup d'Instituts préparent aussi des dilutions
nt de 1/10 à 1/100.000.
u laboratoire d'*Ottawa*, la dilution des tuberculines
vrées aux vétérinaires est basée sur la valeur de l'*Unité*
ve de la tuberculine brute. C'est une mesure sur laquelle
s reviendrons plus loin.
n effectuant notre enquête, nous avions demandé qu'on
ille bien nous fournir quelques renseignements sur les
rses préparations dérivées des cultures de bacilles tuber-
ux ou de la tuberculine ancienne de Robert Koch, qui sont
vrées ou mises en vente par les Instituts officiels ou privés
différents pays. Le nombre de ces préparations — (beau-
) sont des spécialités pharmaceutiques qui n'ont qu'un
rêt commercial et dont les détails de fabrication restent
; ou moins secrets) — est très considérable. Leur étude
tre pas dans le cadre de ce travail.
ous nous bornerons à rappeler les efforts qui ont été faits
vue, d'une part, d'isoler de la tuberculine brute les sub-
ces actives comme *antigènes tuberculeux*, susceptibles de

provoquer dans les organismes la formation d'anticorps sp
fiques et, d'autre part, d'en écarter les antigènes paras
(albumoses, peptones, etc.) dont les effets peuvent être plu
moins nuisibles ou gênants.

Pour séparer ces deux ordres de substances, on a che
soit à purifier la tuberculine brute par divers procédés de
cipitation, soit à obtenir d'emblée, par la culture du bacille
milieux synthétiques, une tuberculine ne contenant ni a
moses, ni peptones.

Ces tuberculines offrent, pour certains usages médicaux
principalement pour le traitement des tuberculeux, des av
tages dont on ne saurait contester l'importance. Outre
leur toxicité est beaucoup moindre, elles sont mieux tolé
et, partant, plus maniables. La mesure de leur activité et
contrôle peuvent être effectués par les mêmes techniques
celles qui sont employées pour la vieille tuberculine et
nous allons maintenant aborder l'étude.

B. — Détermination expérimentale de l'activité des tuberculines. Méthode initiale allemande.

L'activité des tuberculines étant essentiellement vari
suivant leur mode de préparation, l'origine des bacilles
elles proviennent, la virulence de ceux-ci, la composition
milieu qui sert à les cultiver, etc., presque tous les laborato
producteurs ont jugé indispensable de la mesurer. Quelq
uns cependant s'en abstiennent, estimant que les métho
actuellement en usage sont d'une application difficile et
fournissent pas d'indications précises.

La législation de plusieurs pays a cependant imposé l'o
gation de ce titrage. Tel est le cas pour l'Allemagne, le Bré
la France, l'Italie, le Japon, la Tchéco-Slovaquie. Part
ailleurs, il n'existe aucun contrôle autre que celui exercé par
fabricants eux-mêmes.

Il est généralement effectué, — sauf quelques variantes
suivant la technique anciennement adoptée au laboratoire
Robert Koch, modifiée en 1905 par *Otto* et mise régulièrem
en œuvre par ce dernier à l'Institut de Médecine expérimen

Francfort. Elle consiste à prendre un certain nombre de bayes de même poids (350 à 400 grammes), sous la peau ou ns le péritoine desquels on injecte une quantité déterminée milligrammes par exemple, soit 200 millions de bacilles) ıne culture de deux à trois semaines, bien émulsionnée ns l'eau physiologique. A la fin de la troisième ou de la atrième semaine, suivant que l'inoculation virulente a été te dans le péritoine ou sous la peau, on s'assure, par l'au- psie de quelques cobayes, que la tuberculose s'est bien déve- ppée et, dans l'affirmative, on en éprouve 2 à 4 autres par jection sous-cutanée de 0 c. c. 25 à 0 c. c. 30 d'une bonne berculine servant d'étalon (Standard). Ces doses doivent traîner la mort en moins de vingt-quatre heures avec les sions caractéristiques de l'intoxication tuberculinique. Si tte épreuve donne des résultats positifs, c'est que la tubercu- sation des cobayes est assez avancée et l'on peut alors nployer tous les animaux du même lot en inoculant à chacun eux des quantités variables (inférieures et supérieures à c. c. 25) des préparations de tuberculines dont on veut com- arer la toxicité à celle de la tuberculine choisie comme alon.

Toute tuberculine qui ne tue pas le cobaye tuberculeux en oins de vingt-quatre heures à la dose de 0 c. c. 25 est consi- érée comme insuffisamment active.

Cette méthode donne en général des résultats satisfaisants, ais il faut reconnaître qu'elle a l'inconvénient d'être coûteuse arce qu'elle nécessite, pour chaque échantillon, le sacrifice un assez grand nombre de cobayes. Il n'est pas sûr, en outre, ue les renseignements qu'elle fournit soit valables pour les utres espèces animales, en particulier pour l'homme.

C'est pourquoi plusieurs Instituts se refusent à l'employer et réfèrent s'en rapporter aux essais faits directement par les étérinaires sur les bovins, ou par les médecins dans les ser- ices hospitaliers.

Le laboratoire vétérinaire d'*Ottawa* a récemment adopté our ses titrages un procédé basé sur la réaction de fixation u complément, de Bordet-Gengou. Nous y reviendrons plus oin.

Outre les recherches effectuées pour l'évaluation de leur

toxicité spécifique, les tuberculines sont parfois soumises à
épreuves complémentaires destinées à garantir leur stéril
A cet effet, on les ensemence sur les milieux usuels de cultu
en aérobiose et en anaérobiose, et on en injecte une quant
variable à des cobayes non tuberculeux pour s'assurer qu'el
ne renferment aucune substance nuisible à l'animal sain.

On trouvera, en annexe de ce rapport (*Annexe C*),
tableau résumant les réponses fournies par chacun
Instituts producteurs de tuberculine auxquels s'est adres
notre enquête.

C. — Méthodes de titrage étudiées par divers expérimentateu et par les experts de la Commission.

Parmi les diverses méthodes qui ont été proposées pour
titrage des tuberculines, nous retiendrons seulement les su
vantes :

1° La méthode de précipitation, de G. Dreyer et R.
Wollum;

2° La méthode de titrage par la réaction de fixation du co
plément, de E. A. Watson et L. M. Heat, d'Ottawa;

3° La méthode de F. R. Long (Spermatocyt-tuberculin-réa
tion);

4° La méthode de von Lingelsheim-Borrel;

5° Les procédés d'épreuves par cuti- ou intradermo-réa
tions.

I. — Méthode de précipitation de G. Dreyer et R. L. Wollum.

Grâce à l'obligeance du professeur G. Dreyer, l'un de nous
pu étudier, à Oxford, la technique de cette méthode dont o
peut lire une description très complète dans un article publi
par *The Lancet*, le 15 novembre 1924.

Déjà en 1909, A. Calmette et L. Massol avaient préparé u
sérum de bovidé tuberculeux enrichi en anticorps par de
injections répétées de tuberculine, et ils avaient cherché
utiliser ce sérum pour déceler les traces de tuberculine dan

lait et dans les diverses humeurs des sujets tuberculeux. s résultats de leurs expériences n'ayant pas été favorables, ils ent reconnaître que les tuberculines constituent de très uvais antigènes, ce qui fut confirmé dans la suite par utres auteurs et, tout récemment encore, par les recherches A. Boquet et L. Nègre (1).

C'est pourquoi G. Dreyer et L. Wollum, reprenant la même e, se sont adressés, pour l'obtention d'un sérum précipitant es chevaux inoculés par voie intraveineuse avec des doses gressivement croissantes de bacilles dégraissés par l'acé- e, puis formolés (vaccin diaplyte). En trois mois environ, chevaux recevaient ainsi de 0 milligr. 1 à 225 milligrammes bacilles. Leur sérum devenait alors fortement précipitant ur les bacilles dégraissés soumis à la digestion trypsique, et si pour la vieille tuberculine. Il ne donnait aucune floccula- n avec la malléine, ni avec la toxine diphtérique. C'est ce um que les auteurs utilisent, en même temps qu'une stan- d-tuberculine provenant de l'Institut de Médecine expéri- ntale de Francfort-sur-Mein, pour le titrage des tubercu- es.

On prépare d'abord des dilutions de celles-ci à 1 p. 100, . 300, 1 p. 900, 1 p. 2.700, 1 p. 8.100.

Dans une série de tubes de faible diamètre on introduit, avec compte-gouttes de Dreyer, V gouttes du sérum précipitant ué au quart, puis, successivement, dans chacun des tubes, VI, VIII, X et XII gouttes de chacune des dilutions de erculine. On complète partout au volume de XX gouttes par ition de X, IX, VII, V et III gouttes d'eau salée physiolo- ue à 9 p. 1.000. On agite légèrement et on porte les tubes bain-marie à 37° en les immergeant jusqu'aux deux tiers de colonne liquide. Les tuberculines moyennement actives rnissent ordinairement un précipité à 1 p. 900 après neuf ures, temps auquel doit être effectuée la lecture.

L'intensité de la précipitation est indiquée par les termes :

' : précipitation massive totale ;

: précipitation visible à l'œil nu (Standard) ;

r : précipitation visible seulement à la loupe (trace) ;

O : pas de précipité.

Pour les précipitations intermédiaires à ces divers taux, note : T+ ou T —, S+ ou S —, etc.

La lecture étant faite avec ces indications, il s'agit mair nant de les transposer en *Unités Standard*, l'unité de com raison étant fournie par la tuberculine standard de Francfor laquelle on donne conventionnellement la valeur de *100 un* par centimètre cube. Le calcul du nombre d'unités est déd des dilutions de tuberculine qui ont fourni un précipité en *S* et *Tr*. On prend la moyenne des deux résultats.

Pour une détermination exacte, il est recommandé de fa 5 titrages et de prendre la moyenne des résultats chaque f en présence de tuberculine standard.

L'appréciation du degré de floculation de certaines séries dilutions est parfois difficile; aussi est-il utile de se serv pour la lecture, de l'éclairage artificiel sur fond noir. Il nécessaire aussi de prendre certaines précautions :

a) Le sérum précipitant doit être clair, stérile, *non chau* On peut le diluer au quart;

b) Aucun des réactifs (sérum ou tuberculines) ne doit con nir d'antiseptiques;

c) Les tubes doivent être du même calibre et très propres;

d) Le bain-marie à 37° doit être ouvert à l'air libre.

Il ne semble pas que les variations de la teneur de la tube culine en peptones, en sels ou en glycérine, exercent u influence sur la réaction.

Quoi qu'il en soit des résultats très favorables indiqués p les auteurs de cette méthode, celle-ci est passible de no breuses critiques. D'abord, il est difficile d'obtenir de bo sérums précipitants, la valeur de ceux que fournit un mêr animal étant extrêmement variable d'une saignée à l'aut Ensuite, la plupart des tuberculines qu'on peut avoir à titr sont additionnées d'antiseptiques, ce qui rend leur titra impossible.

Enfin — objection plus grave — cette réaction n'est p absolument spécifique, car il suffit souvent de diluer le séru pour que celui-ci floculе et on peut obtenir un précipité pre que aussi abondant en substituant à la tuberculine des extrai concentrés de bacilles paratuberculeux.

out cela explique pourquoi la méthode de titrage par pré-
tation a été abandonnée ou est généralement écartée. Nous
pensons pas que son élégance puisse compenser ses
ltiples inconvénients et qu'il y ait lieu d'en recommander
option pour le contrôle officiel des tuberculines.

II. — Méthode de titrage par la réaction de fixation du complément.

Des essais de titrage des tuberculines par cette méthode
ée sur la réaction de Bordet-Gengou ont été entrepris en
2 aux laboratoires Burroughs et Wellcome, à Londres, et,
peu plus tard, à l'Institut Kitasato, à Tokio. Ils fournirent
résultats si médiocres qu'on dût bientôt les abandonner.

En 1924, à la suite de nouvelles et laborieuses recherches
ctuées au laboratoire d'Ottawa (Canada), E. A. Watson et
M. Heath publièrent un mémoire (1) dans lequel ils préco-
ent l'emploi d'une technique dont ils se déclarent parfaite-
nt satisfaits.

Elle consiste à déterminer *in vitro* la valeur antigène des
erculines en présence d'un sérum riche en anticorps spéci-
e. Celui-ci s'obtient assez facilement en inoculant par voie
aveineuse à un cheval ou à un bœuf indemne, ne réagis-
t pas à la tuberculine, d'abord 1 milligramme, puis, qua-
e jours plus tard, 2 milligrammes d'une culture de bacilles
erculeux virulents. Le trente-cinquième jour après la pre-
ère inoculation, le sérum du cheval fournissait une réaction
ixation positive à la dose de 0 c c. 02 et celui du bœuf à la
e de 0 c. c. 033. Le premier contenait donc 50 unités par
timètre cube et le second 30.

Le cheval seul reçut alors une nouvelle inoculation de 3 mil-
rammes de bacilles virulents (ce fut la dernière). Sept à
torze jours après, pendant la septième semaine de l'expé-
nce, le maximum de la courbe de fixation fut atteint, le titre
nt 0,0066 ou 150 unités par centimètre cube, alors que le
um du bœuf donnait 0,02 ou 50 unités.

Le cheval mourut le cent treizième jour, avec une tubercu-

(1) *Journal of the American Veterinary Medical Association*, 66, nº 1, octobre

lose miliaire des poumons, mais il avait fourni une quan suffisante de sérum pour faire un grand nombre d'expérien Ce sérum titrait 150 unités par centimètre cube avec une d fixe de tuberculine-standard. Son activité était un peu p grande vis-à-vis des suspensions de bacilles tuberculeux et autres antigènes. Il était inactif sur la malléine, l'abortin les extraits de bouillons glycérinés (1).

La dose d'antisérum la mieux appropriée au titrage des tu culines fut précisée en préparant 5 séries de dilutions con nables de tuberculine-standard et en ajoutant à chaque sé respectivement 2 1/2, 5, 10, 20 et 30 unités d'antisérum. séries contenant 10 et 20 unités d'antisérum ont fourn meilleure gradation. Alors, une dose fixe de 20 unités d'a sérum fut employée pour titrer tous les autres échantillons tuberculines commerciales.

La quantité minimum de tuberculine ajoutée à 20 un d'antisérum doit être celle qui est capable de fixer en tota l'unité d'alexine ou complément. On peut dire qu'elle rep sente l'*unité active de tuberculine*. Les tuberculines utilisa pour le diagnostic de la tuberculose du bétail titrent 20 300 unités par centimètre cube. Il en est qui vont jusqu'à Mais on trouve dans le commerce des tuberculines qui titr à peine 20 unités, ou même 0 !

D'après W. et H., 750 et 1.250 unités représentent une d convenable pour le bétail, et les résultats de leur titrage d cordent généralement avec ceux des inoculations aux cob tuberculeux faites suivant la méthode allemande. Leur proc aurait donc l'avantage d'être infiniment plus économique cette dernière, tout en ayant une précision au moins égale.

D'après notre expérience, il y a lieu de faire beaucoup réserves à ce sujet. Un trop grand nombre de facteurs bi giques essentiellement variables interviennent dans c réaction, et rien n'autorise jusqu'à présent à admettre le pa lélisme du pouvoir antigène et de la toxicité des tuberculi Il semble plutôt que le contraire soit l'expression de la vé Ne constatons-nous pas, en effet, que les antigènes tubercul

(1) Dans leur travail, W. et H. signalent les essais infructueux qu'ils faits en vue d'obtenir un sérum anti avec des tuberculines brutes ou bouillons de culture filtrés et non chauffés.

oxiques, privés de tuberculine, l'antigène méthylique de quet et Nègre, par exemple, sont les plus énergiques fixa- urs d'anticorps *in vitro* et les plus actifs producteurs de ces êmes anticorps *in vivo* ?

Nous ne croyons donc pas que la réaction de fixation nous re, pour le titrage des tuberculines, des sécurités suffi- ntes.

III. — Spermatocyt-tuberculin-réaction (de F. R. Long).

Les méthodes de titrage actuellement employées ne permet- nt pas d'apprécier les degrés de toxicité des tuberculines, R. Long a proposé de prendre comme criterium la *sensibi- té testiculaire des cobayes tuberculisés*. Dans un mémoire ublié en 1925 (1), il a indiqué une nouvelle technique de trage dénommée par lui *Spermatocyt-tuberculin-réaction*.

Il insiste d'abord sur le mécanisme de la réaction tuberculi- ique qui, pour lui, se traduit par deux phénomènes distincts : *exsudation* et la *nécrose*. L'exsudation, associée à l'hyperémie ctive, provoque l'œdème rouge caractéristique de la réaction ıtanée. La nécrose de la peau est plus rare. Elle dépend de lusieurs facteurs, notamment du degré de sensibilité du tissu ans lequel se fait l'injection, du type de ce tissu et de la dose e tuberculine. Comme les tissus de la peau, principalement le onjonctif et l'épithélium squammeux, sont relativement résis- ants, la nécrose n'apparaît qu'avec de fortes doses de tubercu- ne. Au contraire, dans le testicule, qui réagit fortement, injection de tuberculine provoque une coagulation typique es spermatocytes et des cellules germinatives qui en dérivent.

La réaction spermatocytique à la tuberculine présente deux hases : une *précoce*, une *tardive*.

Dans la phase précoce, on note, outre une hyperémie t un œdème inflammatoire, une nécrose coagulante des permatocytes et des spermatides, l'augmentation de calibre es tubuli, et une division désordonnée des cellules ger- ninatives : spermatogonies, spermatocytes, spermatides et permatozoaires. Seules, les spermatogonies paraissent nor-

(1) F. R. Long. *Journ. of Infectious Disease*, octobre 1925, p. 368.

males et subsistent après la résorption des cellules néc
tiques.

La phase tardive s'observe trois à quatre semaines ap
l'injection de tuberculine. A ce moment, les tubuli sont at
phiés, limités par une membrane basale et une simple couc
de cellules épithéliales : les spermatogonies. Toutes les aut
figures de multiplication des cellules germinatives ont dispa

La spécificité de cette réaction à la tuberculine paraît inco
testable. Des injections de tuberculine chez les cobayes n
maux ne créent jamais ces modifications tissulaires, non pl
que celles d'extraits de bacilles paratuberculeux.

Histologiquement, le type de cette réaction est semblabl
celui de la réaction cutanée, à l'exception d'une dégénére
cence et d'une nécrose plus accentuées et qui sont dues à u
plus grande sensibilité des cellules germinatives. La tec
nique de cette méthode est la suivante :

Des cobayes mâles, de 400 grammes environ, sont préal
blement infectés par injection sous-cutanée d'une émulsi
bacillaire peu virulente, de manière à provoquer, au bout d'
mois, l'apparition d'un nodule caséeux dans la région lymp
tique correspondante.

A ce moment (après un mois), on injecte dans l'un des t
ticules 0 c. c. 1 d'une solution de tuberculine et, suivant qu'
désire examiner la réaction précoce ou la réaction tardi
on sacrifie l'animal après trente-six heures, ou après un mo

Les dilutions de tuberculine sont faites à 0,1, 0,01, 0,0
et 0,0001 pour les tuberculines non concentrées; à des dos
dix fois moindres pour les tuberculines concentrées. Po
chaque dilution, on prend 2 animaux tuberculisés et, en plu
deux animaux sains. Ceux-ci, servant de témoins, sont inject
avec les solutions les plus concentrées. Au total, 10 coba
(dont 8 infectés) suffisent pour le titrage d'une tuberculi

Le résultat de la réaction est obtenu par l'examen histo
gique d'une coupe médiane du testicule inoculé. En rais
des différenciations des éléments pour un œil non exercé,
est préférable de recourir à l'étude de la réaction tardive.
par exemple, on a procédé à l'injection intratesticulaire
4 dilutions de tuberculine, on constatera que les trois plus for
ont produit la nécrose des cellules germinatives, à l'excepti

:s spermatogonies qui persistent à la périphérie des tubuli. a quatrième au contraire a laissé intacts, dans les tubulis, les ermatocytes et leurs éléments dérivés, ainsi que la spermagénèse. La distinction entre ces images est très nette et constitue une base pour la définition de l'*unité*.

Celle-ci peut, arbitrairement, être considérée comme étant quantité de tuberculine qui arrête la spermatogénèse et, ns le cas indiqué ci-dessus, elle correspondrait à la troisième lution. Si celle-ci est, par exemple, de 1/10.000, il s'ensuit ie 1 cent. cube de cette tuberculine contient 10.000 unités ermatocytiques.

L'*unité spermatocytique* est donc la quantité de tuberculine ffisante pour abolir la spermatogénèse dans la majorité des bulis par l'injection de 0 c. c. 1 de cette substance dans le sticule d'un cobaye de 400 grammes atteint d'une tuberculose bénigne datant d'un mois.

D'après F. R. Long, les avantages de ce procédé seraient : spécificité absolue de la réaction, sa sensibilité dix fois plus ande que la réaction intradermique, la constance de ses sultats et la possibilité de conserver une preuve permanente titrage de chaque produit.

Par contre, la nécessité d'attendre trois à quatre semaines s éléments d'information désirables, les délais de préparaon des coupes histologiques, les difficultés inhérentes à l'étude inutieuse de celles-ci, paraissent être de sérieux obstacles à n adoption dans la pratique.

IV. — Méthode d'inoculation intracérébrale (von Lingelsheim-Borrel).

Instituée par von Lingelsheim en 1898, expérimentée par . Borrel en 1909 (1), cette méthode, basée sur l'inoculation tracérébrale, comparativement chez le cobaye sain et chez le baye tuberculeux, est seulement utilisable pour les tuberculies purifiées par précipitation. Elle ne peut pas être employée ur le titrage des tuberculines brutes, car la glycérine, la peptone et les impuretés que celles-ci renferment possèdent, pour

1) *Société de Biologie*, 6 février 1909.

les cellules nerveuses, une toxicité propre qui ne permet p
d'apprécier les effets toxiques dus à la tuberculine seule.

D'autre part, Neufeld a montré que ce procédé n'est pas s
cifique, car l'inoculation intracérébrale des précipités alc
liques de bouillon glycériné pur produit les mêmes effets.

Nous ne les retenons donc pas.

V. — Procédés d'épreuves par cuti ou intradermo-réaction

La réaction cutanée de von Pirquet est commode pour ve
fier l'activité des tuberculines chez l'homme tuberculeux. I
permet de comparer entre eux les effets de plusieurs dilutio
(généralement de 1 p. 5 à 1 p. 50) d'une même tuberculine
de tuberculines différentes. Mais les résultats qu'elle four
ne sont jamais bien précis. Ils varient suivant la sensibilité
sujets, qui est très différente de l'un à l'autre, et suivant
quantité de tuberculine qui reste sur la petite plaie de sca
fication.

Quoique beaucoup plus douloureuse, la méthode d'inocu
tion intradermique lui est certainement préférable, parce qu'
permet d'introduire *dans le derme* une quantité assez exactem
mesurée de liquide sans que celui-ci se répande à l'extérie
et de telle sorte qu'on soit sûr qu'il est absorbé.

Sa technique fut indiquée d'abord par Mantoux en 1908
proposée par lui pour le diagnostic de l'infection tubercule
chez l'homme. Elle consiste à introduire dans le derme, a
une aiguille fine et courte, montée sur une seringue à injecti
une goutte ou, au maximum, 1/10 de cent cube d'une tub
culine brute diluée à 1 p. 5.000. Le lieu d'élection, chez l'hom
est la face antérieure de la cuisse ou du bras; chez le bœuf
sillon sous-caudal qui part de chaque côté de la marge de l'an
chez le porc, la face antéro-externe de l'oreille (Moussu).

Lorsque la réaction est négative, la minime lésion trau
tique provoquée par l'aiguille n'est plus visible après quaran
huit heures. Si la réaction doit être positive, elle est déjà visi
après quelques heures et atteint, en général, son acmé vers
quarante-huitième heure. Elle a un aspect caractéristique,
« cocarde » : infiltration nodulaire centrale, rose ou rouge
entourée d'un halo rosé d'érythème. L'infiltration centrale p

oir de 1 à 3 centimètres de diamètre. Le halo périphérique a s dimensions très variables qui peuvent atteindre la largeur la paume de la main.

Chez les petits animaux de laboratoire, le cobaye en particu-er, avec 1 goutte de dilution de tuberculine brute à 1 p. 10, réaction positive consiste en une infiltration œdémateuse du erme, de couleur blanche ou rosée, accompagnée souvent d'une ffusion hémorragique. Elle atteint son complet développe-ent quarante-huit heures après la piqûre. Son diamètre est e 12 à 18 millimètres.

A la suite des excellents résultats obtenus avec cette méthode ar Mantoux et Moussu pour le diagnostic chez l'homme et hez les bovidés, puis par Römer au cours de recherches expé-imentales, Löwenstein signala l'intérêt qu'elle peut présenter our le titrage des tuberculines. Mais ce ne fut que tout récem-ent que Paul Lewis et Aronson en Amérique, A. J. Eagleton t E. M. Baxter en Grande-Bretagne, Meister-Lucius und Brü-ig à Hoechst, l'ont étudiée et mise en pratique. La technique tilisée est la suivante :

On procède d'abord à l'infection tuberculeuse d'un lot de obayes de même taille, de même poids (environ 300 grammes), t, autant que possible, de même race. A cet effet, on leur njecte, soit par voie sous-cutanée, soit par voie intrapéritonéale, milligr. 1 de bacilles virulents de type bovin. Trois semaines nviron après l'infection, on injecte à quelques animaux, sous a peau, 0 gr. 02 d'une tuberculine-étalon, pour vérifier leur tat de sensibilité. Si la réaction est franchement positive, on ratique, deux ou trois jours après, l'injection *intradermique* es tuberculines à titrer, diluées à des taux progressivement roissants, de 1/10 à 1/1.000 par exemple. La lecture et la nota-ion du degré de la réaction sont faites après vingt-quatre, qua-ante-huit et soixante-douze heures. Suivant son intensité, on narque par des chiffres (1, 2, 3, 4) ou par des signes les résul-ats obtenus.

Ces injections intradermiques se font aisément sur la sur-ace abdominale des animaux, rasée ou traitée par un liquide épilatoire, puis lavée à l'eau bouillie et soigneusement essuyée. l faut choisir de préférence des cobayes à peau blanche, chez esquels la lecture des réactions est plus facile. On prépare

ainsi une aire cutanée assez large pour l'injection de 10 16 dilutions différentes.

Ce procédé permet de titrer, sur le même animal, au moi deux tuberculines à côté de la tuberculine-étalon. Celle-ci e indispensable à la comparaison des réactions.

Pour éviter les erreurs d'interprétation des résultats, il e recommandable de prendre les précautions suivantes :

1° Les dilutions doivent être récemment préparées en cha geant de pipette pour chacune d'elles et, bien entendu, pou chaque échantillon différent;

2° On se servira, pour injecter chaque dilution, d'u seringue préalablement bien lavée et d'aiguilles courtes fines ;

3° On s'assurera que chaque injection est bien poussée da le tissu dermique et non sous la peau.

Avec cette méthode, le fait de pratiquer *plusieurs injectio* sur le *même animal* atténue les inconvénients qui peuve résulter de l'inégale sensibilité des divers cobayes. Elle a, e outre, l'avantage d'exiger un beaucoup moins grand nomb d'animaux, et elle permet d'apprécier aisément l'activité d divers échantillons de tuberculine. Enfin, elle est d'une appl cation facile et rapide.

D'après notre expérience, elle est incontestablement préféra à toutes celles que nous avons décrites. C'est donc sur elle q nous arrêtons notre choix.

Il importe cependant d'observer que certaines tuberculin qui, même à des taux de dilution élevées, donnent des réactio positives chez le cobaye, n'en fournissent que de négatives ch le bœuf tuberculeux. On ne doit donc pas absolument conclu à l'activité pour l'homme ou pour le bœuf d'une dilution d tuberculine qui se montre active pour le cobaye. C'est pou quoi le National Institute for Medical Research de Londres chargé MM. Douglas, Buxton (de Cambridge) et le majo Dunkin, d'étudier le titrage par inoculation intradermiqu *chez les bovidés*. La conclusion de leurs recherches a été qu cette méthode est la seule qui donne des garanties suffisant pour établir l'activité d'une tuberculine destinée au diagnost de la tuberculose des vaches, si l'on prend soin de faire, ch le même animal, deux injections intradermiques successive

ec la même dilution à quarante-huit heures d'intervalle. La conde injection donne alors constamment une réaction plus tte.

D. — Recherches des experts de la Commission.

La multiplicité des méthodes employées jusqu'ici par les vers laboratoires pour le titrage des tuberculines, et le fait ne chacune d'elles est encore discutée, nous ont engagés à ntreprendre nous-mêmes des recherches qui puissent nous ermettre d'en apprécier la valeur respective.

Nous avons commencé par préparer des tuberculines en uti-sant les milieux synthétiques de culture qui nous ont paru le ieux appropriés à leur production. Ensuite, comparativement vec les nôtres et avec la tuberculine de l'Institut Pasteur de aris, nous avons étudié un certain nombre d'échantillons de berculines commerciales qui nous ont été remis par la ection d'Hygiène de la Société des Nations.

a) Tuberculines synthétiques. — Nous avons employé trois ouches bacillaires différentes :

1° Une souche humaine assez virulente (Ratti);

2° Une souche bovine très virulente (Vallée);

3° Une souche de BCG (Bacille Calmette Guérin) rendue avi-lente et non tuberculigène par 230 cultures successives sur le de bœuf glycérinée à 5 p. 100.

Les milieux employés furent les suivants :

1° A titre de comparaison, le bouillon de veau peptoné et ycériné à 4 p. 100 qui sert à la préparation des tuberculines à nstitut Pasteur.

2° Le milieu de Sauton amené, avec l'ammoniaque pure, au H : 7,2 (avant stérilisation) :

	GRAMMES
Asparagine	4,
Acide citrique	2
Phosphate bipotassique	0,5
Citrate de fer ammoniacal	0,5
Sulfate de magnésie	0,5
Eau distillée	1.000

3° Le milieu de Calmette et Massol :

Carbonate de soude	1
Sulfate ferreux	0,04
Sulfate de magnésium	0,05
Phosphate de potassium	1
Chlorure de sodium	8,5
Glucose	10
Glycérine	40
Peptone	10
Eau distillée	1.000

4° Milieu de A. Borrel :

Sulfate acide de potassium	0,25
Monophosphate de potassium	0,50
Sulfate de magnésium	0,25
Nitrate de sodium	1
Carbonate d'ammonium	1
Asparagine	4,50
Glucose	5
Mannite	5
Glycérine	20
Silicate de potassium	0,02
Sulfate de fer	0,03
Eau distillée	1.000

Chacune des trois souches bacillaires fut ensemencée da trois ballons contenant 100 cent. cubes de chaque liquide portés à l'étuve à 38° pendant six semaines.

On constata qu'alors que le BCG se développait très rapi ment et abondamment sur le milieu de Sauton, sa culture, ai que celle du bacille bovin et du BCG sur le milieu de Bor restaient très grêles.

Les tuberculines qu'on obtint par la concentration à 1/10 contenu de chacun des ballons furent utilisées avec la tuber line de l'Institut Pasteur employée comme étalon, et au avec diverses paratuberculines, ainsi qu'avec la malléine.

Nous avons étudié comparativement leur titrage :

1° Par la réaction de fixation du complément;

2° Par précipito-réaction;

3° Par inoculation intradermique sur cobayes sensibilisés

4° Par cuti-réaction chez des sujets humains tuberculeux

b) Sérum anticorps. — Pour nos expériences relatives a

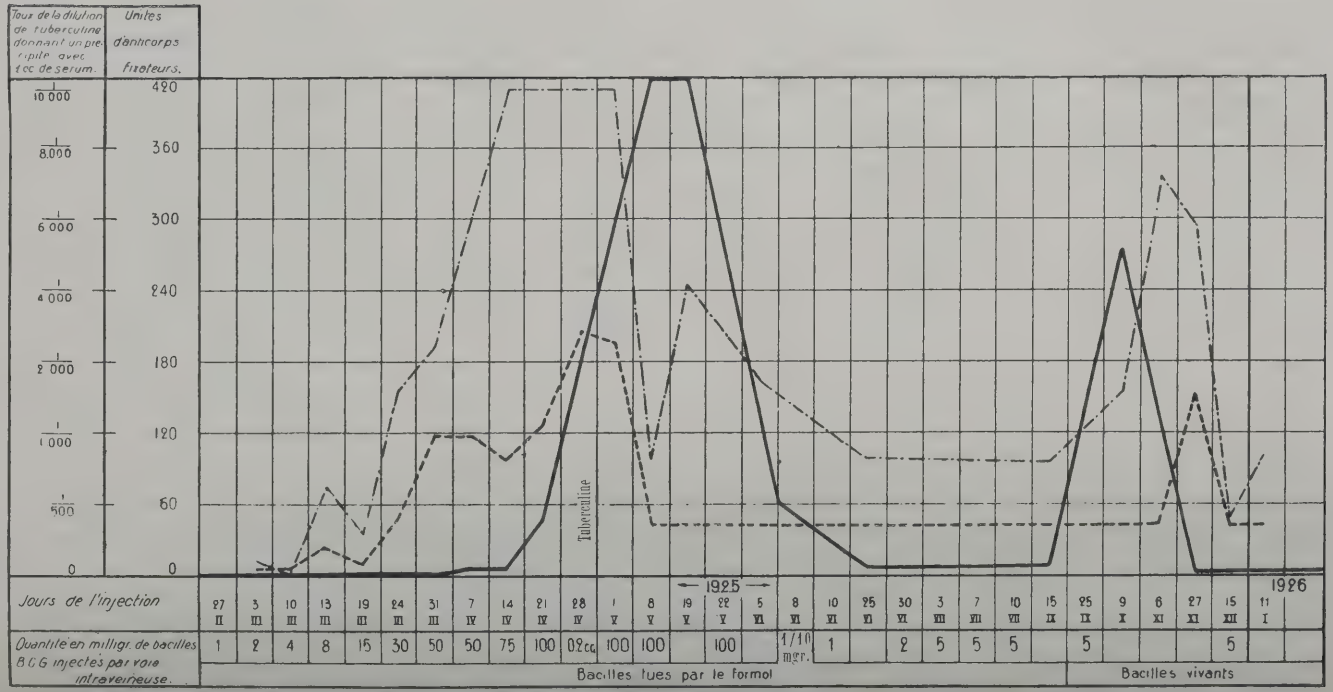
actions *in vitro* (fixation du complément et précipito-réac-n), nous avons dû préparer un sérum antituberculeux en munisant un cheval, non avec la tuberculine brute, qui ne ssède par elle-même presque aucune propriété antigène, ais au moyen de bacilles BCG. Ceux-ci furent émulsionnés ns l'eau physiologique formolée à 5 p. 100, conservés suite à l'étuve à 37° pendant un mois, puis à la température laboratoire.

Notre cheval reçut d'abord deux fois par semaine, puis utes les semaines, par voie intraveineuse, des doses crois-ntes de ces bacilles : 1, 2, 4, 6, 15, 30, 50, 75 et 100 milli-ammes. Toutes ces inoculations furent faites dans l'espace de eux mois et furent suivies d'une injection de 0 c. c. 2 de berculine brute. Au cours du troisième mois d'immunisa-on, le cheval reçut encore trois nouvelles injections, cha-une de 100 milligrammes de bacilles. A la suite des fortes actions thermiques qu'elles provoquèrent, on revint, pendant quatrième mois, aux injections de faibles doses, de 1/10, 2, 5 milligrammes, qui furent continuées jusqu'à la fin du nquième mois. Après deux mois de repos, le cheval reçut une rie d'injections intraveineuses de BCG vivants. Nous repro-uisons d'ailleurs ci-après la courbe d'immunisation de ce neval.

Le titrage des anticorps du sérum ainsi obtenu fut régulière-en effectué, suivant la technique de Calmette et Massol, en résence de l'antigène méthylique de Boquet et Nègre et, mparativement, avec la tuberculine brute diluée à 1 p. 50 c. c. 5).

Nul au début, le taux des anticorps s'est rapidement élevé. près un mois et demi de traitement, il atteignait 400 unités ar centimètre cube. Il resta à ce niveau pendant six semaines, our tomber ensuite à 100 unités. De nouvelles injections de CG le firent remonter à 250 unités.

Avec l'antigène méthylique, le taux des anticorps s'est ujours montré notablement supérieur à celui obtenu avec la uberculine brute.


Taux de la dilution de tuberculine donnant un précipité avec 1cc de serum.
Unités d'anticorps fixateurs.
1/10 000
1/8 000
1/6 000
1/4 000
1/2 000
1/1 000
1/500
0
420
360
300
240
180
120
60
0
Tuberculine
1925
1926
Jours de l'injection
27 II
3 III
10 III
13 III
19 III
24 III
31 III
7 IV
14 IV
21 IV
28 IV
1 V
8 V
19 V
22 V
5 VI
8 VI
10 XI
25 XI
30 VI
3 VIII
7 VII
10 VII
15 IX
25 IX
9 X
6 XI
27 XI
15 XII
11 I
Quantité en milligr. de bacilles B.C.G injectés par voie intraveineuse.
1
2
4
8
15
30
50
50
75
100
0,2cc
100
100
100
1/10 mgr.
1
2
5
5
5
5
5
Bacilles tués par le formol
Bacilles vivants
Quantité d'anticorps fixateurs obtenus avec l'antigène methylique de Boquet et Negre.
Quantité " " " " la tuberculine brute diluée au 1/50 è comme antigène.
Quantité de précipitines.

° Expériences de titrage par la réaction de fixation du complément.

Des essais préliminaires nous ayant fait constater que la ution à 1 p. 20 était, pour notre tuberculine-étalon, la mieux ropriée, nous l'avons le plus généralement employée à la e uniforme de 0 c. c. 5.

Pour comparer entre elles la valeur antigène des tubercu- s, il est avantageux d'exprimer en chiffres à quel nombre nités antigènes elles correspondent par centimètre cube. Il it, à cet effet, d'établir le rapport entre la quantité d'alexine isée et la quantité minimum d'antigène qui fixe la totalité 'alexine mise en œuvre. Ce chiffre, multiplié par le taux de ilution de l'antigène, donne le nombre d'unités que renferme ui-ci par centimètre cube.

Par exemple, une tuberculine qui fixe à partir de 0 c. c. 5 ne dilution à 1 p. 20 a pour valeur $\frac{2}{0,5} \times 20 = 80$ unités. e autre qui fixe à partir de 0 c. c. 3 aura comme valeur $\times 20 = 132$ unités, etc...

Les résultats ainsi obtenus ne varient pas, pourvu que le tème hémolytique soit constant.

Évaluée d'après cette méthode, la valeur antigène de notre erculine-étalon correspondait à 130 unités (1).

eule, la tuberculine préparée avec la souche de bacille nain Ratti (en bouillon glycériné) se montre plus active que alon. Elle titrait 200 unités.

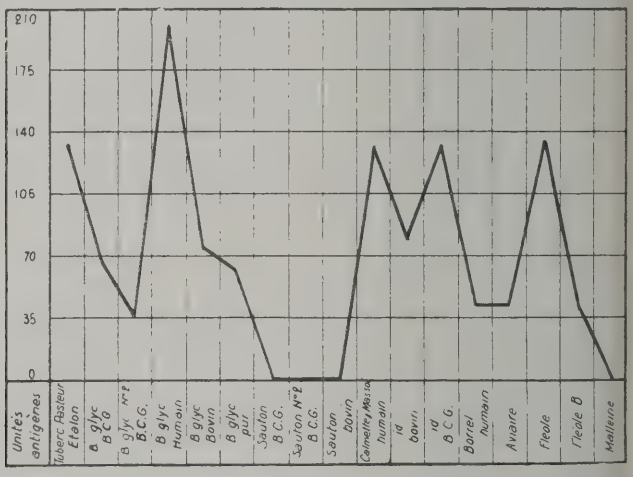
Trois autres ne différaient pas sensiblement de l'étalon : aient celles préparées avec la souche humaine et avec le G sur milieu de Calmette et Massol, et avec une paratuber- ine (fléoline).

Par contre, les trois tuberculines obtenues du milieu de

(1) On peut encore se servir, pour la détermination de la valeur d'une tuber- ne, soit d'une quantité fixe d'alexine et d'antigène et de doses croissantes érum, soit d'une quantité constante d'antigène et de sérum, et de doses ssantes d'alexine. Nous avons également employé cette méthode. Elle nit des chiffres un peu plus élevés que la précédente. Ainsi la tubercu- étalon donnait 160 unités au lieu de 130. Mais le rapport entre les deux édés reste le même.

Saulon, et la malléine, n'avaient aucun pouvoir fixateu
valeur antigène des autres tuberculines variait entre 80
unités. Enfin nous avons reconnu que le bouillon pe
glycériné pur, concentré au dixième de son volume primi
une valeur antigène de 60 unités.

La valeur en unités antigènes de chacune de nos tubercu
est reportée en diagramme dans la courbe II ci-après :



Courbe II. — Valeurs en unités antigènes des diverses tuberculin

2° Expériences de titrage par la méthode de précipit

Au cours de l'immunisation de notre cheval en vu
l'obtention d'un sérum anti qui pût être utilisé pour nos
riences de titrage, nous avons fait un grand nombre d'ess
précipitation de tuberculine de l'Institut Pasteur dilu
1/5 à 1/50 en présence de 0,1 à 2 cent. cubes de sérum.
mélange, les tubes étaient immergés dans un bain-marie
pendant trois heures, puis portés à l'étuve à 37°. Aucune
lation ne se produisait. Nous n'avons obtenu ainsi qu
résultats négatifs. Nous n'avons pas été plus heure
mettant en présence d'une quantité fixe de sérum (0 c.
des quantités croissantes de tuberculine diluée à 1/25,
1/100 et 1/300.

Plus tard (deux mois et demi après le début de l'imm

Tuberculines	1/100	1/1.000	1/2.500	1/5.000	1/10.000
Etalon	+++	+++ (3 heures).	++ (3 heures).	++ (3 heures).	+
Humaine (Borrel)	+++	+++ (3 heures).	++ (3 heures).	++ (3 heures).	+
Humaine (bouillon glycériné)	+++	+++ (3 heures).	++ (3 heures).	++ (3 heures).	+
Humaine (C. et M.)	+++	++ (3 heures).	+ (7 heures).	+ (7 heures).	0
Bovine (C. et M.)	+++	+++ (3 heures).	++ (5 heures).	+ (7 heures).	0
B. C. G. sur Sauton (n° 2)	+++	+++ (3 heures).	++ (5 heures).	+ (7 heures).	0
B. C. G. sur Sauton (n° 1)	+++	+++ (5 heures).	++ (7 heures).	0	0
B. C. G. bouillon glycériné (n° 1)	++	+ (7 heures).	0	0	0
B. C. G. bouillon glycériné (n° 2)	++	+ (7 heures).	0	0	0
B. C. G. (C. et M.)	+++	+ (7 heures).	0	0	0
Bovine Sauton	+++	++ (5 heures).	0	0	0
Bovine bouillon glycériné	+++	++ (3 heures).	0	0	0
Aviaire	++	+ (7 heures).	0	0	0
Fléoline	+++	0	0	0	0
Fléoline 1924	0	0	0	0	0
Bouillon glycériné pur	0	0	0	0	0
Malléine	0	0	0	0	0

tion) notre sérum ayant fourni à la dose de 1 cent. cub floculat avec 20 cent. cubes de tuberculine-étalon dilu 1/400, nous renouvelâmes nos essais en utilisant toujour volume de 20 cent. cubes de tuberculine diluée à des variables, de 1/100 à 1/10.000. Après trois heures de séjou bain-marie à 45° nous faisions une première lecture, puis seconde et une troisième après cinq et sept heures.

Par cette méthode, le bouillon glycériné, la malléine fléoline n'ont donné aucune trace de floculat. La tubercul étalon (de l'Institut Pasteur) floculait nettement jus 1 p. 10.000. Il en était de même pour nos tuberculines prépa avec le bouillon glycériné ou le milieu de Borrel. C obtenues avec les bacilles humains et bovins sur milieu Calmette et Massol, et avec le BCG sur milieu de Sau floculèrent jusqu'à 1/5.000. Celles préparées avec le BCG bouillon glycériné et sur le milieu de Calmette et Massol, le bacille bovin sur bouillon glycériné et sur milieu de Sau ainsi que la tuberculine aviaire floculaient jusqu'à 1/1. Enfin la fléoline ne floculait que jusqu'à 1/100.

Le tableau I résume nos observations.

3° Expériences de titrage par intradermo-réaction sur le cobaye sensibilisé.

Nous avons utilisé des cobayes de même poids (350 gramm à peau blanche ou rose) inoculés avec une émulsion a homogène que possible de bacilles bovins (souche Vallée) dose de 1/100 de milligrammes, depuis cinq semaines, sou peau d'une cuisse, de telle sorte que le ganglion ingu correspondant soit manifestement tuméfié. Nos anim étaient rasés sur toute la surface abdominale. Nous disposi ainsi d'une aire suffisante pour l'injection de dix ou douze d tions sur le même animal.

La quantité de liquide introduite dans le derme é toujours de 0 c. c. 1. On notait les résultats observés ap vingt-quatre heures, deux et trois jours : rougeur, infiltrat œdémateuse, suffusion hémorragique.

Le plus souvent la réaction est à son acmé à la quara huitième heure. En règle générale, nous avons pratiqué su

	1/500	1/750	1/1.000	1/1.250	1/1.500	1/2.000	1/2.500	1/3.000
Tuberculine-étalon	+++	+++	+++	++	++	++	++	+
Milieu et souche :								
Bouillon glycériné humain	+++	+++	+++	++	++	++	++	+
Sauton bovin	+++	+++	+++	++	++	++	+	+
Sauton B. C. G. (2)	+++	+++	+++	++	++	+	+	+
C. M. humain	+++	+++	++	++	++	+	±	0
Sauton B. C. G. (1)	+++	++	++	++	+	+	0	0
Borrel humain	+++	+++	++	++	+	0	0	0
C. M. et B. C. G.	+++	+++	++	++	+	0	0	0
Bouillon glycériné bovin	++	++	+	0				
C. M. bovin	++	+	0	0				
Bouillon glycériné B C. G.	++	+	0	0				
Bouillon glycériné B. C. G. 1923	++	0	0	0				
Aviaire	0	0						
Fléoline	0	0						
Bouillon glycériné	0	0						
Malléine	0	0						

même cobaye l'injection de trois séries de quatre dilutio une de tuberculine-étalon et deux des tuberculines à titrer.

Nos premiers essais furent faits avec des dilutions à 1/5 1/750, 1/1.000 et 1/1.250, ce qui correspond à 1/5.000, 1/7.5 1/10.000 et 1/12.500 de tuberculine pure. Ces doses permir déjà la différenciation de quelques produits. Pour la tuberculi étalon, pour l'une de celle préparées avec le BCG sur milieu Sauton, et pour quelques autres, il fallut faire des dilutio encore plus étendues, de 1/1.500, 1/2.000, 1/2.500 et jusq 1/3.000.

Les mêmes déterminations effectuées sur un autre lot cobayes tuberculisés fournirent des résultats tout à analogues. Très rarement quelques animaux donnaient réactions dissemblables, de sorte qu'on peut considérer c méthode comme suffisamment sensible et précise.

Le tableau II résume les observations que nous avons pu fa sur les diverses tuberculines préparées par nous.

4° Essais de titrage par cuti-réaction sur les malades tuberculeux.

Il importe d'observer que les sujets humains tubercul présentent d'énormes variations de sensibilité cutanée vis-à d'une même tuberculine et qu'en outre il est impossible savoir quelle est exactement, ou approximativement, la qu tité de tuberculine qui a pénétré dans le derme après sca cation simple de celui-ci.

Nous avons estimé pourtant qu'il y avait lieu de recherc si la cuti-réaction pratiquée en séries sur le même sujet pou servir à apprécier la valeur respective de diverses tuberculi

Grâce à l'obligeance de M. le professeur Léon Bernard a mis son service de tuberculeux pulmonaires de l'hôp Laënnec à notre disposition, nous avons pu choisir un cert nombre de malades atteints de formes cliniques assez semblab (tuberculose ulcéro-caséeuse, peu fébrile, avec expectora bacillifère).

Les scarifications de l'épiderme furent pratiquées à la rég externe du bras, et la réaction fut considérée comme positive lorsqu'il existait, après quarante-huit heures, une zone éry

MILIEU-SOUCHE						
	1/10	1/100	1/500	1/10	1/100	1/500
C. M. Bovin	++	++	+	++	+	+
Sauton B. C. G., n° 2.	++	++	+	++	+	0
Sauton bovin.	++	++	+	++	+	0
Bouillon glycériné B. C. G.	+++	+	0	++	0	0
C. M. et B. C. G.	++	+	0	+	0	0
C. M. et B. C. G.	+	0	0	0	0	0
C. M. humain	++	0	0	+	0	0
C. M. humain.	++	++	+	+	0	0
Bouillon glycériné bovin	++	+	0	+	0	0
Aviaire	++	+	±	±	0	0
Aviaire	++	+	±	±	0	0
Sauton B. C. G, n° 1	+++	++	+	0	0	0
Sauton B. C. G., n° 1.	+	0	0	0	0	0
Bouillon glycériné pur	++	+	0	0	0	0
Fléoline	++	+	0	0	0	0
Malléine	±	0	0	0	0	0
Malléine	++	+	±	0	0	0

mateuse plus ou moins large, accompagnée d'infiltration d
mique nettement perceptible au toucher. On put ainsi consta
qu'un bon nombre de sujets réagissaient positivement avec
dilution à 1 p. 500 de la tuberculine-étalon de l'Institut Paste
Le tableau III résume les résultats de ces divers essais.

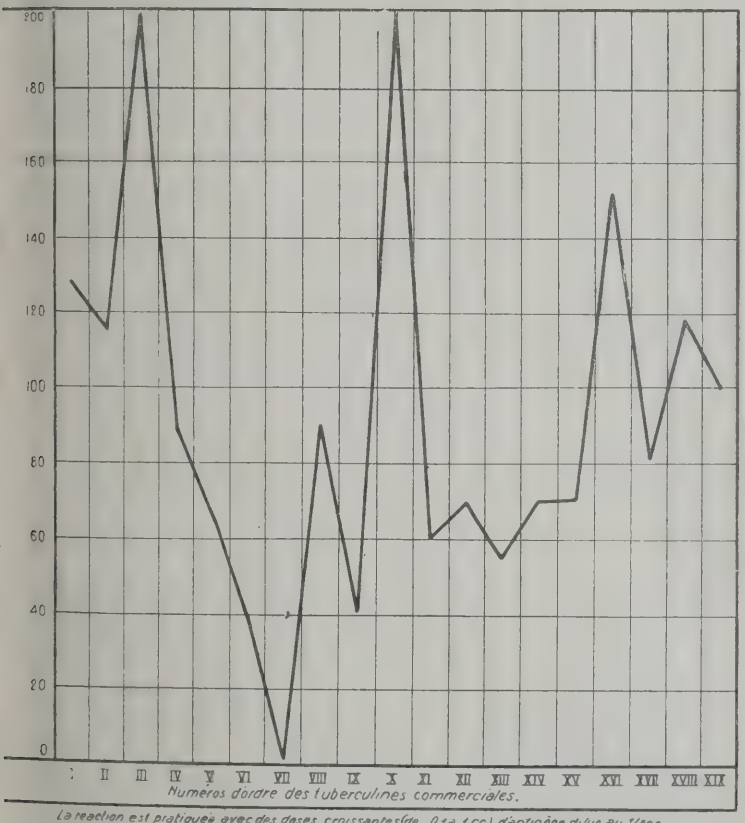
E. — Essais de titrage des tuberculines commerciales.

La Section d'Hygiène de la Société des Nations nous a ren
pour ces essais 19 échantillons de tuberculines de différen
provenances et qu'on trouvera numérotés ci-après de I à XI
Nous les avons utilisés en vue de comparer, pour chac
d'eux, les résultats fournis par les quatre méthodes suivante
1° Réaction de fixation du complément;
2° Réaction de floculation ou de précipitation;
3° Cuti-réactions chez l'homme tuberculeux;
4° Intradermo-réactions sur le cobaye sensibilisé.

1° Méthode de titrage par la fixation du complément.

Les réactions furent pratiquées avec des doses croissan
de 0 c. c. 1 à 1 cent. cube d'une dilution à 1/20 de chacun
spécimens, deux doses hémolysantes d'alexine au 1/15,
0 c. c. 1 de notre sérum antituberculeux de cheval.
Pour la tuberculine n° VI, la dilution à 1/20, étant t
faible, fut ramenée à 1/10.
Pour la tuberculine n° III, la dilution à 1/20 étant, au c
traire, trop forte, elle fut portée à 1/30.
Ces titrages ayant été répétés chacun plusieurs fois, n
donnons les moyennes de leurs résultats exprimées en uni
antigènes contenues dans 1 cent. cube du produit brut.
Il ne semble pas que la présence d'antiseptiques (acide p
nique) dans certaines tuberculines ait sensiblement modifi
sens de la réaction.
Un seul échantillon (n° VII) était complètement dépou
de toute propriété antigène et n'a, par conséquent, pas pu
soumis au titrage. Il s'agissait d'une tuberculine précipitée.
L'examen des chiffres du tableau n° IV et celui de la courbe

ıtrent que les tuberculines aviaires XVII et XIX ont une ur antigène correspondant respectivement à 80 et à unités.


200
180
160
140
120
100
80
60
40
20
0
I II III IV V VI VII VIII IX X XI XII XIII XIV XV XVI XVII XVIII XIX
Numéros d'ordre des tuberculines commerciales.
La réaction est pratiquée avec des doses croissantes (de 0,1 à 1 cc.) d'antigène dilué au 1/20e
La tuberculine VII est une tuberculine desséchée, privée de glycérine.

Courbe III. — Résultats du titrage des tuberculines commerciales par la réaction de fixation du complément.

es plus faibles et les plus fortes valeurs trouvées sont de t 200 unités. Il est intéressant de noter que chacun de ces : a été atteint par une tuberculine bovine et par une tuberne sans albumose : la tuberculine III (albumose-freie) et la erculine bovine X titraient 200 unités, tandis que l'albumose- VI et la tuberculine bovine IX titraient à peine 40 unités. ous insistons de nouveau sur les difficultés de cette tech-

nique. Elles résultent surtout de l'activité variable de l'alex utilisée. Il est, en tous cas, indiqué de ne se servir, pour c réaction, que d'une alexine hémolysant à la dose de 0 c. c.

Tableau IV. — **Résultats du titrage des tubreculines commerci par la méthode de fixation du complément**

NUMÉROS D'ORDRE DES TUBERCULINES	UNITÉS ANTIGÉNIQUES par centimètre cube.
I	130
II	115
III	200
IV	90
V	70
VI	40
VII	»
VIII	90
IX	40
X	200
XI	60
XII	70
XIII	55
XIV	70
XV	70
XVI	150
XVII	80
XVIII	115
XIX	100

2° Méthode de titrage par floculation (ou précipitation

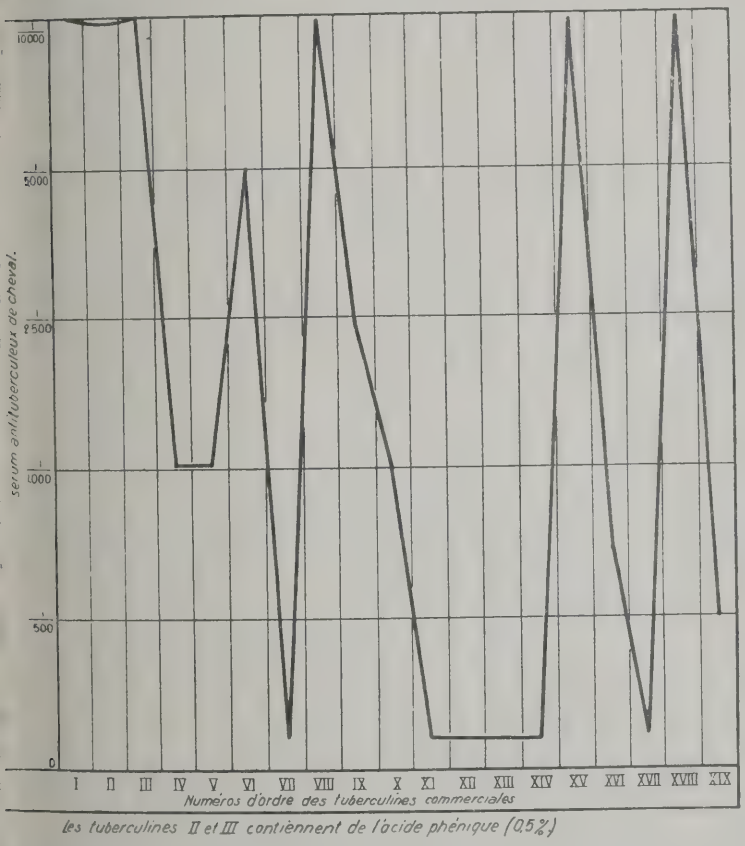
Nous avons effectué toutes nos expériences avec la m technique qui consistait à ajouter 1 cent. cube de notre sé antituberculeux de cheval à 20 cent. cubes de tuberculine di à des taux variables : 1/100, 1/500, 1/1.000, 1/2.500, 1/5 et 1/10.000.

Après mélange des liquides, on immergeait les tubes dan bain-marie à 38° et la lecture de la réaction était faite a trois, cinq et huit heures.

Nous avons constaté que certaines tuberculines achevaie floculer en trois heures; d'autres seulement en huit heu aucune au delà de ce délai.

Les contrôles effectués en diluant le sérum précipitant dans l'eau physiologique, ou en additionnant les dilution tuberculines de sérum normal de cheval, sont toujours r négatifs.

ur les 19 tuberculines titrées par cette méthode, 6 — dont e tuberculine-étalon de l'Institut Pasteur, — ont floculé en tion à 1/10.000. Six autres n'ont fourni de floculat qu'en tion à 1 p. 100.


1/10000
1/5000
1/2500
1/1000
1/500
0
sérum antituberculeux de cheval.
I II III IV V VI VII VIII IX X XI XII XIII XIV XV XVI XVII XVIII XIX
Numéros d'ordre des tuberculines commerciales
les tuberculines II et III contiennent de l'acide phénique (0,5%)

Courbe IV. — Résultats du titrage des tuberculines commerciales par la méthode de précipitation.

Pour différencier les tuberculines floculant au même taux de ution, nous avons fait suivre les chiffres des signes +, ++ +++ suivant l'intensité apparente du précipité. (Voir bleau V et courbe IV.)

TABLEAU V. — **Résultats du titrage des tuberculines commercia par la méthode de floculation.**

NUMÉROS D'ORDRE DES TUBERCULINES	TAUX de la dilution de tuberculin donnant un précipité avec 1 cent. cube de séru
I	1/10 000 +++ (*b*)
II (*a*)	1/10.000 +
III (*a*)	1/10.000 +++
IV	1/1.000 ++
V	1/1.000 ++
VI	1/5.000 +
VII	1/100 ++
VIII	1/10 000 +
IX	1/2.500 +
X	1/1.000 +
XI	1/100 ++
XII	1/100 +
XIII	1/100 ++
XIV	1/100 +
XV	1/10.000 +
XVI	1/1.000 +++
XVII	1/100 ++
XVIII	1/10.000 ++
XIX	1/500 +

(*a*) Tuberculines contenant 0,5 % d'acide phénique.
(*b*) Les signes (+) (++) (+++) indiquent les différences de l'intensité du précipit

3° MÉTHODE DE TITRAGE PAR CUTI-RÉACTION CHEZ L'HOMME TUBERCULEUX.

Ces expériences ont été effectuées dans le service de M. le p fesseur Léon Bernard à l'Hôpital Laënnec.

Des scarifications de 4 à 5 millimètres de longueur, distan les unes des autres de 25 millimètres au moins, furent fai sur la région externe du bras ou sur la face externe de cuisse, les 3 supérieures servant toujours pour la tuberculi étalon, les 3 autres pour la tuberculine à titrer.

Chaque échantillon était dilué dans l'eau glycérinée 50 p. 100 pour obtenir un liquide de viscosité sensibleme anologue à celle des produits bruts. On employait ensuite s la solution pure, soit des dilutions à 1/10, 1/100 et 1/500.

Chaque tuberculine fut titrée sur quatre malades au moi et, dans les cas où les réactions étaient négatives, les épreuv furent renouvelées avec la solution pure.

La lecture des réactions était faite après vingt-quatre et qua-
ıte-huit heures. Dans quelques rares cas la réaction, appa-
nment négative après quarante-huit heures, ne devint nette
e le troisième ou le quatrième jour.

Le caractère de la réaction fut noté par les signes suivants :

+++ réaction très forte ;
++ réaction forte ;
+ réaction faible, mais nette ;
± rougeur ;
0 négative.

Comme les tuberculines humaines ou bovines sont habituel-
ment employées, pour les réactions cutanées, à l'état pur, ou
luées à 1/10, on peut établir dans une certaine mesure leur
.leur respective en se basant seulement sur les résultats
)tenus comparativement avec la solution pure et avec la solu-
)n au 1/10. C'est ainsi que les tuberculines II, IV, VIII, IX,
et XVIII doivent être considérées comme très bonnes et pos-
dant une activité analogue à celle de l'étalon I.

La valeur de la tuberculine V et surtout de la tuberculine VI
:t un peu faible, mais encore satisfaisante.

Par contre, les tuberculines III, XI, XIII, XIV, XVII et XIX
'ont aucune valeur pratique pour la cuti-réaction chez l'homme.
n peut en dire autant des tuberculines XII, XV et XVI qui,
ıème employées pures, ne donnent qu'irrégulièrement des
éactions positives.

La tuberculine VII (précipitée) diluée à 1/10 donne des résul-
ıts équivalents à ceux fournis par la tuberculine I (étalon).

4° Méthode de titrage par intradermo-réactions sur le cobaye sensibilisé.

Le titrage des tuberculines par ce procédé a été effectué sur
es cobayes tuberculisés par injection sous-cutanée de
milligr. 01 de bacilles tuberculeux bovins très virulents
souche bovine Vallée). Cinq semaines après l'infection, la sen-
ibilité des animaux fut recherchée par l'injection intrader-
nique de quelques dilutions de tuberculine étalon. Cet essai
)réliminaire jugé satisfaisant, nous avons procédé au titrage
le l'activité des divers échantillons de tuberculine. A cet effet,

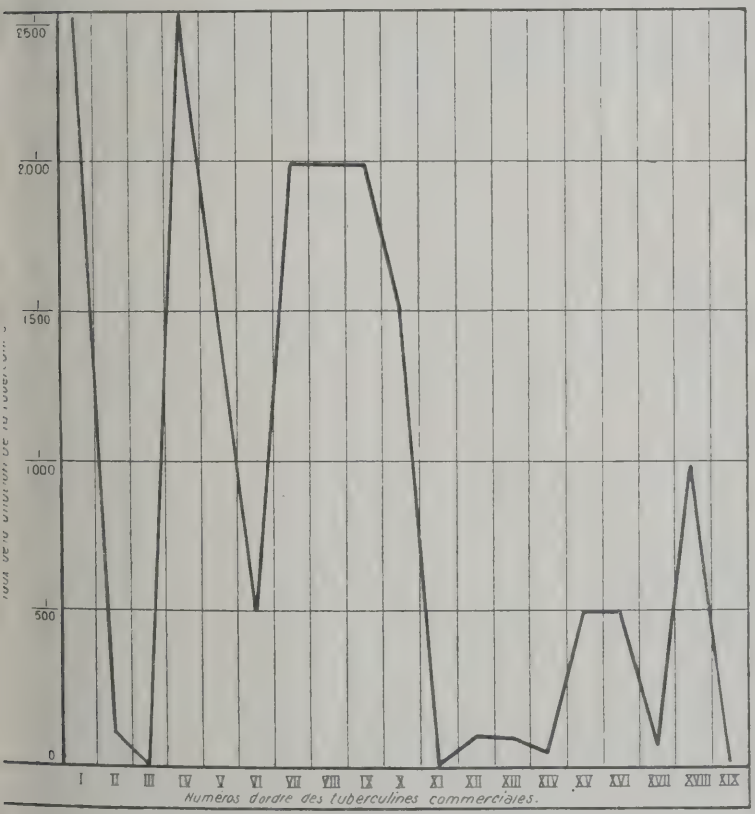
TABLEAU VI. — **Résultats des cuti-réactions pratiquées chez des sujets tuberculeux avec les tuberculines commerciales.**

Tuberculine-étalon n° I.				*Tuberculine humaine n° II.*			
Pure	1/10	1/100	1/500	Pure	1/10	1/100	1/500
+	0	0	0	+	0	0	0
+	0	0	0	+	0	0	0
++	+	+	0	++	+	0	0
+++	++	0	0	+++	++	0	0
+	+	0	0	+	0	0	0
+	—	—	—	+	—	—	—
				Tuberculine sans albumine n° III.			
—	++	+	0	—	0	0	0
—	++	0	0	—	0	0	0
—	0	0	0	—	0	0	0
—	++	+	0	—	0	0	0
++	—	—	—	0	—	—	—
++	—	—	—	+	—	—	—
++	—	—	—	0	—	—	—
++	—	—	—	0	—	—	—
++	—	—	—	0	—	—	—
				Tuberculine humaine n° IV.			
++	+	0	—	0	0	0	—
±	0	0	—	±	0	0	—
+++	++	+	—	++	+	0	—
±	0	0	—	±	0	0	—
++	0	0	—	++	0	0	—
+	0	0	—	+	0	0	—
++	0	—	—	+	0	—	—
+	0	0	—	+	0	0	—
+	0	0	—	+	0	0	—
				Tuberculine bovine n° V.			
++	++	0	—	++	0	0	—
+++	++	+	—	++	++	0	—
+	0	0	—	+	0	0	—
+++	++	0	—	++	+	0	—
				Tuberculine sans albumine n° VI.			
++	+	0	—	±	0	0	—
+++	++	+	—	+	0	0	—
+++	+++	++	—	+++	+	0	—
+	+	0	—	0	0	0	—
				Tuberculine précipitée n° VII.			
++	+	0	—	—	±	0	—
±	0	0	—	—	0	0	—
+	+	0	—	—	+	0	—
0	0	0	—	—	0	0	—
++	+	0	—	—	+	0	—
++	++	+	—	—	+	0	—

Tuberculine-étalon n° I.				*Tuberculine humaine n° VIII.*			
Pure	1/10	1/100	1/500	Pure	1/10	1/100	1/500
++	+	+	0	++	+	+	+
±	0	0	0	±	0	0	0
++	++	+	0	+++	++	0	0
−	0	0	−	−	0	0	−
−		+	0	−	−	+	0
−	++	0	0	−	0	0	0
+	−	−	−	+	−	−	−
++	+	±	−	+	±	0	−
++	++	+	−	++	+	0	−
				Tuberculine bovine n° IX.			
−	++	0	0	−	++	0	0
−	++	+	0	−	++	0	0
−	++	++	0	−	++	0	0
−	++	0	0	−	++	0	0
				Tuberculine bovine n° X.			
+++	++	++	−	++	++	0	−
+++	+++	+	−	+++	+++	+	−
++	++	0	−	+	±	0	−
++	++	+	−	++	+	0	−
+	0	0	−	+	0	0	−
				Tuberculine humaine n° XI.			
++	+	0	−	0	0	0	−
++	+	0	−	0	0	0	−
+	0	−	−	0	0	−	−
+	0	−	−	±	0	−	−
+	0	−	−	0	0	−	−
+	0	−	−	±	0	−	−
				Tuberculine humaine n° XII			
+++	++	+	−	+	0	0	−
++	+	0	−	0	0	0	−
0	0	0	−	0	0	0	−
++	+	0	−	0	0	0	−
++	+	+	−	0	−	−	−
				Tuberculine humaine n° XIII.			
+	0	0	−	0	0	0	−
++	+	+	−	0	0	0	−
++	+	0	−	0	0	0	−
++	+	0	−	±	0	0	−
+	0	0	−	0	0	0	−
+	−	−	−	0	−	−	−
+	−	−	−	0	−	−	−
+	−	−	−	0	−	−	−
+	−	−	−	0	−	−	−

Tuberculine-étalon n° I.				*Tuberculine humaine n° XIV.*			
Pure	1/10	1/100	1/500	Pure	1/10	1/100	1/500
+	0	0	—	0	0	0	—
0	0	0	—	0	0	0	—
++	+	0	—	0	0	0	—
+	—	—	—	0	—	—	—
+	—	—	—	0	—	—	—
+	—	—	—	0	—	—	—
+	—	—	—	0	—	—	—
				Tuberculine humaine n° XV.			
+	0	0	—	0	0	0	—
+	+	0	—	0	0	0	—
+++	++	+	—	±	0	0	—
+	0	0	—	0	0	0	—
+	0	0	—	0	0	0	—
++	+	0	—	+	0	0	—
+++	++	+	—	+	0	0	—
++	+	0	—	0	0	0	—
				Tuberculine bovine n° XVI.			
±	0	0	—	0	0	0	—
+	±	0	—	0	0	0	—
0	0	0	—	0	0	0	—
+	+	0	—	+	0	0	—
+	0	0	—	+	0	0	—
				Tuberculine aviaire n° XVII.			
±	0	0	—	0	0	0	—
+	0	0	—	0	0	0	—
++	0	0	—	0	0	0	—
++	+	0	—	0	0	0	—
				Tuberculine mixte n° XVIII.			
++	+	0	0	++	+	0	0
+	±	0	0	+	±	0	0
+++	++	+	0	++	+	0	0
++	+	0	0	++	0	0	0
0	—	—	—	0	—	—	—
++	—	—	—	++	—	—	—
				Tuberculine aviaire n° XIX.			
—	++	+	0	—	0	0	0
++	0	0	—	0	0	0	—
+	0	0	—	0	0	0	—
—	++	0	0	—	0	0	0
—	++	+	0	—	0	0	0

animaux reçurent en injection intradermique 0 c. c. 1 tuberculine diluée du 1/10 au 1/2.500. Les solutions de berculine-étalon furent de 1/1.000, 1/1.500, 1/2.000, 1/2.500. nous basant sur les données fournies par la cuti-réaction ez les sujets tuberculeux, nous avons eu recours, pour les antillons qui s'étaient montrés peu actifs par cette méthode, x dilutions faibles 1/10, 1/100, 1/500; et pour les autres aux utions fortes de 1/1.000 à 1/2.500.



Courbe V. — Résultats du titrage des tuberculines commerciales par *intradermo-réactions* sur le cobaye sensibilisé.

Après vingt-quatre heures et quarante-huit heures, la lecre des réactions intracutanées fut faite et nous donnons au

tableau VII la moyenne des chiffres obtenus chez les dive animaux. (Voir aussi courbe V.)

Une tuberculine (tuberculine n° IV) s'est montrée aus active que l'étalon, et trois autres (tuberculines n^{os} VII, VI et IX) possédaient une activité très voisine de celui-ci. Un se échantillon (tuberculine n° XI) n'a pas donné de réaction à l dilution au 1/10. Pour trois tuberculines (III, XIV et XIX), réaction n'a pas dépassé la dilution au 1/10, et pour quat autres (tuberculines II, XII, XIII et XVII), la dilution au 1/10

Tableau VII. — **Résultats du titrage des tuberculines commercial par intradermo-réactions sur le cobaye sensibilisé.**

NUMÉROS D'ORDRE DES TUBERCULINES	TAUX de la dilution maximum de tuberculine provoquant une réaction intradermique
I	1/2 500
II	1/100
III	1/10
IV	1/2.500
V	1/1.500
VI	1/500
VII	1/2.000
VIII	1/2.000
IX	1/2.000
X	1/1.000
XI	0
XII	1/100
XIII	1/100
XIV	1/10
XV	1/500
XVI	1/500
XVII	1/100
XVIII	1/1.000
XIX	1/10

La comparaison de la valeur des tuberculines, appréciée p la cuti-réaction chez les sujets tuberculeux et l'intradermo-réa tion chez le cobaye, montre que les résultats sont assez conco dants, surtout pour celles qui sont les moins actives. Parmi l tuberculines qui, par cuti-réaction, avaient été jugées inef caces, sept sur neuf n'ont provoqué de réactions intradermiqu qu'avec des dilutions ne dépassant pas le 1/100. Le taux de dilution maximum active des deux autres était de 1/500.

Les tuberculines V et VI, dont l'activité cutanée était suf

nte, ont donné des réactions intradermiques au 1/1.500 et au 500. Quant aux échantillons de valeur analogue en cuti-réac-on à celle de l'étalon, leur activité réactionnelle variait de 1.000 au 1/2.500. Nous notons toutefois une exception : la berculine n° II, dont la valeur avait été jugée égale à celle de talon par cuti-réaction et qui s'est montrée peu active par jection intradermique. La dose réactionnelle de cette tuber-line n'a pas dépassé la dilution au 1/100.

Nous tenons à faire remarquer qu'il est important, pour le trage par cette méthode, de posséder des cobayes adultes bien sistants, pesant de 450 grammes à 600 grammes, à peau anche, sinon les caractères de la réaction locale peuvent être ténués et d'interprétation douteuse.

Conclusions.

L'étude comparative que nous avons pu faire des diverses éthodes qu'en l'état actuel de nos connaissances il est pos-ble d'utiliser pour le titrage des tuberculines nous conduit proposer au Comité d'Hygiène de la Société des Nations les onclusions suivantes :

1° Le procédé de titrage par la réaction de fixation du com-lément ne permet pas de mesurer la toxicité des tuberculines. expose à de multiples causes d'erreurs résultant :

a) De ce que les milieux de culture (sauf certains milieux ynthétiques, tels que celui de Sauton) ont par eux-mêmes des ropriétés antigènes plus ou moins marquées et très variables;

b) Du fait que certains bacilles paratuberculeux (fléole par xemple) peuvent produire des substances dont le pouvoir ntigène *in vitro* est comparable à celui de la tuberculine brute, lors que les paratuberculines sont dépourvues de toxicité pour es animaux tuberculeux.

2° Le procédé de titrage par la réaction de floculation pour-ait s'appliquer à la plupart des tuberculines, mais à la con-lition expresse de disposer d'un *sérum précipitant étalon*. Or n tel sérum, ayant un pouvoir floculant assez élevé, est très difficile à obtenir.

D'autre part, cette réaction n'a aucun caractère de spécificité

et elle ne traduit en aucune manière la neutralisation de tuberculine par l'anti-sérum.

3° La méthode initiale de Robert Koch (modifiée par Otto et par d'autres expérimentateurs) de mesure *in vivo* de la toxicité des tuberculines par la détermination de la dose mortelle en vingt-quatre heures pour le cobaye tuberculeux, donne des résultats approximatifs sur l'une des propriétés des tuberculines (*pouvoir toxique pour l'animal tuberculeux*). Elle ne tient aucun compte du *pouvoir antigène*. Elle nécessite le sacrifice d'un grand nombre de cobayes pour le titrage d'une même tuberculine comparativement avec une tuberculine-étalon qu'il est indispensable de posséder. Elle est, de ce fait, très coûteuse et peu pratique.

4° Les cuti-réactions en séries parallèles, *chez l'homme tuberculeux*, permettent d'évaluer comparativement la valeur diagnostique des diverses tuberculines ou les effets de diverses dilutions d'une même tuberculine sur un seul ou sur plusieurs malades. Mais les résultats qu'elles fournissent manquent de précision parce qu'une partie seulement de la tuberculine introduite dans les scarifications est absorbée. En outre, elles nécessitent des incisions épidermiques multiples que les malades acceptent difficilement, et il n'est pas sûr qu'elles soient inoffensives. On ne peut donc les utiliser que dans des circonstances exceptionnelles.

5° *L'inoculation intradermique*, pratiquée en séries parallèles chez le même animal préalablement sensibilisé (cobaye ou bovin tuberculeux), fournit les résultats de beaucoup les plus satisfaisants. Elle permet de mesurer sur le même sujet l'activité (pouvoir toxique et pouvoir antigène) de plusieurs tuberculines comparées à une tuberculine choisie comme étalon. Elle est incontestablement spécifique puisque ni les paratuberculines, ni la malléine, ni les bouillons glycérinés, ne déterminent de réactions comparables à celles que produisent les tuberculines, et puisqu'elle est inoffensive pour les sujets sains.

Elle ne nécessite qu'une faible dépense d'animaux et les risques d'erreurs provenant de l'inégale sensibilisation de ceux-ci sont réduits au minimum par l'utilisation d'un même animal pour plusieurs tuberculines.

Elle donne des indications plus précises que les autres

thodes, plus faciles à interpréter, plus rapidement obtenues. l importe toutefois d'observer qu'elle ne permet pas de erminer la valeur absolue d'une tuberculine (toxicité et ıvoir antigène) vis-à-vis des différentes espèces animales sibles. Elle ne vaut que pour l'espèce animale soumise à preuve, de sorte qu'une tuberculine titrée, par exemple, sur obaye tuberculeux, peut manifester une activité toxique ou pouvoir antigène différents pour le bœuf et pour l'homme.)'où, pour chaque tuberculine, la nécessité d'un contrôle tant sur des sujets tuberculeux appartenant à l'espèce ani- le à laquelle l'usage de cette tuberculine est destiné (obser- ions : *Annexe* D).

*
* *

Les faits et observations qui précèdent nous obligent donc à nclure qu'en raison de notre ignorance actuelle de la nature substances actives qui entrent dans la constitution des erculines, il est sans doute prématuré de proposer l'adop- n de règles internationales pour la mesure de l'activité de produits. Il importe que leur titrage fasse encore l'objet de herches expérimentales. Toutefois on peut utilement recom- nder aux divers laboratoires qui préparent des tuberculines nmerciales d'en effectuer le contrôle de préférence par le océdé des *réactions intradermiques en séries*, comparati- ment avec une tuberculine-étalon sur un même animal sen- ilisé.

ANNEXE A

Questionnaire.

a) *Préparation de la tuberculine brute (vieille tuberculin*

1. Quelles races de bacilles tuberculeux utilisez-vous?
2. Quelle est la composition du milieu de culture?
3. Quel est le *p*H initial de votre milieu de culture?
4. Quelle est la durée du séjour de la culture à l'étuve?
5. La culture est-elle tuée avant la filtration :
   par la chaleur?
   par un autre procédé?
6. Le volume de la culture est-il réduit par évaporation av
   ou après la filtration?
7. La filtration s'effectue-t-elle sur :
   papier filtre n° marque
   bougie n° marque
8. Stérilisez-vous le filtrat ainsi obtenu :
   par la chaleur?
   par un autre procédé?
9. La tuberculine brute que vous délivrez constitue-t-elle
   mélange de diverses tuberculines provenant de races ou
   souches bacillaires différentes?
10. Si tel est le cas, quelles sont les proportions de tubercu
    de race humaine, bovine ou aviaire contenues dans
    mélange?
11. Délivrez-vous une tuberculine diluée?
12. Si tel est le cas, à quelle dilution de la tuberculine br
    correspond-elle?
13. Ajoutez vous aux tuberculines que vous délivrez une su
    stance conservatrice, et, si tel est le cas, quelle est
    nature et la proportion de la substance ajoutée?

a) Délivrez-vous d'autres préparations que la tuberculine brute de Koch?

b) Pouvez-vous indiquer, au moins sommairement, le mode de fabrication, leurs propriétés et leurs caractères?

c) Sont-elles destinées au diagnostic des affections bacillaires ou à leur thérapeutique?

d) Préparez-vous et délivrez-vous des dilutions de tuberculine brute, ou d'autres tuberculines (lesquelles) destinées spécialement aux réactions cutanées ou intradermiques? Sous quelles formes délivrez-vous ces préparations?

b) *Procédé de titrage de la tuberculine brute.*

Procédez-vous à un titrage régulier de votre tuberculine brute?

Un titrage est-il rendu obligatoire par la loi?

Pratiquez-vous le titrage sur le cobaye tuberculeux?

Quelle est la technique suivie et la race employée pour rendre le cobaye tuberculeux?

Procédez-vous à une épreuve préliminaire, destinée à montrer si les cobayes sont aptes à servir au titrage définitif?

Par quelle voie introduisez-vous, chez le cobaye tuberculeux, la tuberculine à titrer?

Titrez-vous par rapport à une tuberculine-étalon ou appréciez-vous seulement la toxicité de votre tuberculine par son effet sur le cobaye?

Quel est le laboratoire d'où provient votre tuberculine-étalon?

Depuis quand l'employez-vous?

Est-elle conservée sous forme liquide ou solide?

Est-elle stable?

Effectuez-vous un titrage préliminaire et un titrage définitif?

Pratiquez-vous le titrage définitif par un ou plusieurs procédés?

25. Titrez-vous la tuberculine *in vitro* et, si tel est le cas, vo
procédé de titrage repose-t-il sur le principe :
de la déviation du complément?
de la précipitation?
d'autres réactions biologiques?
26. Titrez-vous la tuberculine à l'état brut ou après dilutio
27. Soumettez-vous la tuberculine à d'autres épreuves q
celle de l'évaluation de sa toxicité spécifique?

ANNEXE B

Liste des 34 laboratoires ayant répondu au questionnair

Allemagne.

1. Behringswerke, Marburg.
2. Meister Lucius und Brünig, Hœchst a. M.
3. E. Merck, Darmstadt.
4. Chemische Fabrik Schering, Berlin.

Australie.

5. Commonwealth Serum Laboratories, Melbourne.

Autriche.

6. Staatliches Serotherapeutisches Institut, Vienne.
7. Alpenländische Serum Werke, Graz.

Brésil.

8. Institut Brésilien de Microbiologie, Rio de Janeiro.
9. Institut Oswaldo Cruz, Rio de Janeiro.

Canada.

10. Biological Laboratory, Ottawa.

Chili.

11. Institut d'Hygiène expérimentale, Montevideo.

France.

12. Institut Pasteur, Paris.

Grande-Bretagne.

The Lister Institute, Londres.
The Wellcome Physiological Laboratories, Beckenham.
Evans Sons, Lescher et Webb Limited, Higher Runcom (Cheshire).
MM. Duncan and Flockhard, Londres.

Italie.

Laboratorio Bruschettini, Gênes.

Japon.

Institute for infectious diseases, University, Tokio.
Kitasato Institute for infectious diseases, Tokio.
Hoshi Pharmacy C°.
Ishigami Institute.
Osaka Kessei Yakuin (Serum Pharmacy).

Pays-Bas.

Rijks serum inrichting, Rotterdam.
Institut pour maladies parasitaires et infectieuses, Utrecht.
Institut de Pathologie comparée, Leyde.
Dr Veenbaas, Leeuwaarden, Service d'Hygiène vétérinaire.

Pologne.

Professeur Odo Bujwid, Cracovie.

Roumanie.

Faculté de Médecine, Bucarest.

Suède.

Laboratoire Bactériologique de l'Etat, Stockholm.
Institut vétérinaire de l'Etat, Stockholm.

Tchèco-Slovaquie.

Dr Veleminsky, Prague.
Laboratoire Médica, Prague.
Sero-Therapeutic Institut, Ivanovice, Moravie.

Ukraine.

Institut Sanitaire Bactériologique, Kharkoff.

Tableau résumant les réponses fournies par les laborato

LES NOMS des laboratoires correspondant au numéro d'ordre sont mentionnés à l'annexe B	RACES des bacilles utilisés	COMPOSITION du milieu de culture son *p*H initial	AGE des cultures
1	4 souches humaines, 2 souches bovines.	1 kilogramme de viande de cheval, 4 kilogrammes d'eau, 3 p. 100 de glycérine, 1 p. 100 de peptone, 0,5 p. 100 de NaCl. *p*H = 7,1 à 7,2.	3 mois et plus.
2	Bacilles humain, bovin et aviaire.	Bouillon glycériné peptoné. *p*H = pas déterminé.	4 à 5 semaines.
3	Bacilles humain et bovin.	Extrait de viande, peptone et glycérine. *p*H = 6,6.	4 à 6 mois.
4	Bacille humain.	—	—
5	Bacilles humain et bovin.	1 gramme de veau, 1 cent. cube d'eau, 1 p. 100 de peptone, 0,5 p. 100 de NaCl, 5 p. 100 de glycérine. *p*H = 7,8.	6 semaines à 2 mois.
6	Bacilles humain, bovin et aviaire.	1 p. 100 de peptone, bouillon, 6 p. 100 de glycérine. *p*H = 7,4.	2 mois.
7	Bacille bovin.	Bouillon de bœuf glycériné à 2,5 p. 100. *p*H = 6,4.	4 à 6 semaines.
8	Bacilles humain et bovin.	Bouillon simple, glycériné à 6 p. 100. *p*H = ?	2 mois.

SUR LE MODE DE PRÉPARATION DE LA TUBERCULINE BRUTE.

s tion ntration	MODES de conservation des tuberculines concentrées	FORMES sous lesquelles les tuberculines sont délivrées
avant filtra- ion sur pa- 602.	A l'état pur, sans nouveau chauffage. Addition de 0,5 p. 100 d'acide phénique.	Tuberculine humaine, bovine et mixte, concentrée ou diluée à 1/10.
avant filtra- ion sur pa-	A l'état pur, sans nouveau chauffage. Addition de 0,5 p. 100 d'acide phénique.	Tuberculine humaine, Perlsucht tuberculine, tuberculine aviaire, concentrées.
avant filtra- ion sur pa- bougie.	A l'état pur, sans nouveau chauffage.	Tuberculine humaine concentrée.
	—	Ertuban.
avant filtra- ion sur un ier compre- es de papier che d'ouate s de papier	A l'état pur, sans nouveau chauffage. Addition d'un mélange de 100 parties d'acide phénique et 15 parties d'eau en proportion de 0,5 p. 100 d'acide phénique pur.	Tuberculines humaine et bovine concentrées et diluées de 1/10 à 1/100.000.
ıis filtration ltre.	Le filtrat est stérilisé par la chaleur. Addition de 0,5 p. 100 de tricrésol aux tuberculines concentrées.	Tuberculine humaine, bovine et aviaire délivrées séparément à l'état brut. Dilutions jusqu'au 1/100.000 de tuberculine humaine pour le traitement.
ıis filtration iltre n° A.	Le filtrat est stérilisé par la chaleur.	Tuberculine bovine concentrée ou diluée.
ıis filtration Chamber-	Le filtrat est stérilisé par la chaleur.	Tuberculine humaine et bovine concentrée ou diluée au 1/10.

LES NOMS des laboratoires correspondant au numéro d'ordre sont mentionnés à l'annexe B	RACES des bacilles utilisés	COMPOSITION du milieu de culture son *p*H initial	AGE des cultures	
9	Bacille humain.	Bouillon glycériné. *p*H = 6,5.	1 mois.	A
10	Bacille bovin.	Glycérine 5 p. 100, sucre 1 p. 100, sel 0,5 p. 100, peptone 1 p. 100, infusion de bœuf ou de veau. *p*H = 8.	10 à 12 semaines.	3
11	Bacille humain.	Bouillon de viande de bœuf avec pommes de terre hachées. Macération 24 heures, filtration, stérilisation. *p*H = 7 — 7,2.	2 mois.	P
12	Bacilles humain et bovin.	Bouillon de veau peptonisé glycériné à 4 p. 100. *p*H = 7,6 à 7,8.	6 semaines.	P
13	Bacille bovin.	Bouillon glycériné à 5 p. 100. Le bouillon est formé d'une digestion trypsique de viande de cheval. *p*H = 7,8.	6 à 8 semaines.	P
14	Bacilles humain et bovin.	Bouillon de veau glycériné. *p*H = 7,5 à 7,7	10 à 24 semaines.	P
15	Bacilles humain et bovin.	Bouillon de veau glycériné. *p*H = 7 à 7,5.	6 à 10 semaines.	P
16	Bacilles humain et bovin.	Bouillon de veau standard glycériné à 5 p. 100. *p*H = 7,2 à 7,3.	5 semaines.	P

, ion ıtration	MODES de conservation des tuberculines concentrées	FORMES sous lesquelles les tuberculines sont délivrées
papier, puis Chamber-	A l'état pur sans nouveau chauffage et addition de 0,5 p. 100 d'acide phénique.	Tuberculine mixte humaine et bovine concentrée ou diluée au 1/10.
ès filtration ltre et bougie	Chauffage 1 heure à 100° et addition de 0,5 p. 100 d'acide phénique.	Tuberculine bovine concentrée ou diluée suivant son activité.
nt filtration tre Laurent.	Le filtrat est stérilisé par la chaleur et additionné de 0,5 p. 100 d'acide phénique.	Tuberculine humaine concentrée ou diluée au 1/10 et plus.
nt filtration hardin.	Le filtrat est stérilisé par la chaleur.	Tuberculine mixte, 75 p. 100 de bovine et 25 p. 100 d'humaine concentrée ou diluée au 1/10.
ès filtration ltre.	A l'état pur, sans nouveau chauffage. Addition de 0,5 p. 100 d'acide phénique.	Tuberculine concentrée ou diluée en proportions égales avec de l'eau phéniquée à 0,5 p. 100.
ès filtration e papier et efeld.	Le filtrat n'est pas stérilisé mais additionné de 0,5 p. 100 d'acide phénique.	Tuberculine humaine ou bovine concentrée ou diluée au 1/10.
aporées au ıme initial, s évaporées tration sur	Chauffage à 100° pendant une demi-heure et addition de 0,5 p. 100 d'acide phénique pour T. et P. T. T. O. A. et P. T. O. chauffées à 60-70°.	Tuberculines humaines ou bovines concentrées ou diluées.
ès filtration iltre.	Le filtrat est stérilisé par la chaleur.	Tuberculine humaine ou bovine concentrée ou diluée.

LES NOMS des laboratoires correspondant au numéro d'ordre sont mentionnés à l'annexe B	RACES des bacilles utilisés	COMPOSITION du milieu de culture son *p*H initial	AGE des cultures	
17	Bacille humain.	*a*) Bouillon de viande glycériné. *b*) Milieu à l'œuf de Besredka. *c*) Milieu à l'œuf d'après une méthode personnelle. *p*H = ?	40 à 50 jours.	P
18	Bacille humain.	A 500 grammes de viande de bœuf, on ajoute de l'eau pour obtenir 1 litre de bouillon, 10 grammes de peptone, 5 grammes de sel, 40 grammes de glycérine. *p*H = 6,8 — 7.	8 semaines.	P
19	Bacille humain.	Bouillon ordinaire, 1. p. 100 de peptone, 4 p. 100 de glycérine. *p*H = 6,8 — 7.	5 semaines.	P
20	Bacille humain.	Bouillon peptoné glycériné à 4 p. 100. *p*H = ?	8 semaines.	P
21	Bacille humain.	Bouillon peptoné à 1 p. 100, glycériné à 3 p. 100. *p*H = 7.	4 semaines.	P
22	Bacille humain.	Bouillon peptoné à 1. p. 100, glycériné à 4 p. 100. *p*H = ?	4 à 8 semaines.	P
23	Bacilles humain, bovin et aviaire.	Bouillon de pomme de terre, glycériné à 5 p. 100. *p*H = 6,9.	8 semaines.	P
24	Bacille bovin.	Bouillon glycériné. *p*H = 6.	6 semaines.	P
25	Bacilles humain, bovin, du porc, du bœuf et aviaire.	Bouillon ordinaire glycériné à 2,5 p. 100. *p*H = 7,2.	6 semaines.	P

ion tration	MODES de conservation des tuberculines concentrées	FORMES sous lesquelles les tuberculines sont délivrées
s filtration ardin pour n bouillon. en milieu nt pas con-	Le filtrat des cultures en bouillon est stérilisé par la chaleur.	Tuberculine humaine concentrée.
t filtration	Le liquide filtré n'est pas stérilisé, mais additionné de 0,5 p. 100 d'acide phénique.	Tuberculine humaine concentrée.
nt filtration apier filtre.	Le liquide filtré n'est pas chauffé, mais on y ajoute 0,5 p. 100 d'acide phénique.	Tuberculine humaine concentrée ou diluée du 1/4 au 1/1.000.
ès filtration ltre.	Le filtrat est stérilisé par la chaleur et additionné de 0,5 p. 100 d'acide phénique.	Tuberculine humaine concentrée ou diluée de 1/10 à 1/1.000.
ès filtration ltre.	Le filtrat n'est pas stérilisé, mais on y ajoute 0,5 p. 100 d'acide phénique.	Tuberculine humaine brute.
avant filtra- sieurs cou- ier filtre.	Le filtrat n'est pas stérilisé, mais on y ajoute 0,5 p. 100 d'acide phénique.	Tuberculine humaine concentrée et diluée de 1/10 au 1/1.000 et au delà.
ès filtration e et amiante.	Le filtrat est stérilisé par la chaleur.	Tuberculine humaine, bovine et aviaire concentrée et diluée au 1/10.
nt filtration iltre.	Le filtrat est stérilisé par la chaleur.	Tuberculine bovine concentrée, réservée seulement pour l'ophtalmo-réaction.
nt filtration hardin.	Le filtrat est stérilisé par la chaleur.	Tuberculine concentrée ou diluée suivant les demandes.

LES NOMS des laboratoires correspondant au numéro d'ordre sont mentionnés à l'annexe B	RACES des bacilles utilisés	COMPOSITION du milieu de culture son *p*H initial	AGE des cultures
26	Bacille bovin.	Eau de pomme de terre, bouillon peptoné à 1 p. 100, NaCl à 0,5 p. 100, glycériné à 5 p. 100. *p*H = 6.	6 semaines.
27	Bacille humain.	Bouillon de bœuf, peptone 1,5 p. 100, NaCl 0,5 p. 100. *p*H = 7,5.	3 à 4 mois.
28	Bacille humain.	Bouillon de bœuf peptoné et glycériné à 4 p. 100. *p*H = 7,2	2 à 3 mois.
29	Bacille humain.	Bouillon de bœuf, NaCl 3 p. 100, peptone 1 p. 100, glycérine 3 p. 100, NaH^2PO^4 4 p. 100. *p*H = 6,7 à 6,9.	6 à 8 semaines.
30	Bacille bovin.	Bouillon peptoné et glycériné ordinaire. *p*H = acide.	2 mois.
31	Bacilles humain et bovin.	Bouillon glycériné ordinaire. *p*H = alcalin.	6 à 18 mois.
32	Bacilles humain et bovin.	Bouillon de bœuf glycériné. *p*H = 6,8 à 6,9.	6 semaines.
33	Bacilles humain, bovin et équin.	Bouillon ordinaire glycériné à 9 p. 100. *p*H = 7,2 à 7,6.	2 à 3 mois.
34	Bacilles humain et bovin.	Bouillon peptoné à 1 p. 100 et glycériné à 3 p. 100. *p*H = 6,6 à 6,9.	2 à 3 mois.

on ration	MODES de conservation des tuberculines concentrées	FORMES sous lesquelles les tuberculines sont délivrées
t filtration hardin ou	La tuberculine B n'est pas stérilisée.	Tuberculine bovine concentrée.
n après sé- u filtration tre.	Le filtrat est chauffé deux fois à 100° pendant 30 minutes.	Tuberculine humaine concentrée ou diluée à 1/10.
1/10 puis près sédi- ndant 15 à	La culture est mise en ampoules après décantation et chauffée à 100° pendant 30 minutes.	Tuberculine humaine concentrée ou diluée au 1/4 dans la glycérine neutre.
s filtration erkefeld.	Le filtrat est chauffé à 60° et additionné de 0,5 p. 100 d'acide phénique.	Tuberculine humaine concentrée.
t filtration	A l'état pur, sans nouveau chauffage ni addition d'antiseptiques.	Tuberculine bovine concentrée.
papier.	Addition de 1 p. 100 de phénol.	Tuberculomucines humaines et bovines pures non diluées.
s filtration ltre.	Le filtrat est stérilisé par la chaleur et additionné de phénol.	Tuberculine humaine ou bovine concentrée.
nt filtration ltre.	Le filtrat est chauffé à 110-120°.	Tuberculine brute polyvalente (2 parties de tuberculine humaine, 4 p. de tuberculine bovine et 2 p. de tuberculine équine). Dilutions au 1/10. Tuberculines réservées à l'usage vétérinaire.
nt filtration ltre.	Le filtrat est tyndallisé et additionné de 0,5 p. 100 d'acide phénique.	Tuberculine humaine ou bovine concentrée et diluée au 1/4 jusqu'à 1/5.000.

ANNEXE D

Observations de cas montrant les différences obtenues par les différents procédés.

Tuberculines nos III et X.
Tuberculines nos XV, XVI et XII.
Tuberculines nos XVI, IV, V et X.
Tuberculines nos IX et VI.

Tuberculines nos III et X. — Elles possèdent le même pou antigène. La première précipite au taux de la dilution 1/10. (mais la présence d'acide phénique peut modifier ce résulta n'a aucune action en cuti et intradermo-réaction). La deuxiè précipite à la dilution au 1/1.000; possède en cuti-réaction u activité égale à l'étalon et en intradermo-réaction une acti moyenne.

Tuberculines nos XV, XVI, XII. — La valeur de ces tube lines, appréciées par la cuti-réaction, est pratiquement null très minime par l'intradermo-réaction. Les nos XV et XII une valeur antigène (70) égale et le n° XVI une valeur dou (150). Les taux de la précipito-réaction sont de 1/10.0 1/1.000 et 1/100.

Tuberculines nos XVI, IV, V et X. — Ces 4 tuberculines p sèdent un pouvoir précipitant égal de 1/1.000. Deux d'en elles, nos XVI et X, ont une valeur antigène très forte (150 200 unités); leur activité en cuti et en intradermo-réaction pour l'une très faible, et pour l'autre forte.

Les deux autres tuberculines nos IV et V ont une valeur a gène moyenne (90-70 unités) et leur activité en cuti-réaction insuffisante pour les considérer comme de très bonnes tu culines. Toutefois, en intradermo-réaction, la tuberculine IV montre supérieure à la tuberculine V.

Tuberculine n° IX. — Celle-ci possède une *forte* activité

i et intradermo-réaction alors que son pouvoir antigène est plus *faibles* (40 unités). Sa valeur de précipitation est plutôt *moyenne* grandeur, correspondant à 1/2.500.

Tuberculine n° VI. — Tuberculine sans albumose précipitant tement (1/5.000). Son pouvoir antigène est *faible* (40 unités). valeur réactionnelle, appréciée par la cuti et l'intradermo-ction, est *moyenne*.

NOTE ADDITIONNELLE

Des recherches intéressantes ont été récemment effectuées r Laidlaw et Dudley (1), Howard Mueller (2), sur la nature certains éléments spécifiques du bacille tuberculeux ou de la berculine. Se basant sur les travaux de Zinsser et Park sur résidus antigènes du bacille de Koch, et de Avery et Heidel-rger sur l'extraction de certains produits du pneumocoque, s auteurs ont soumis une grande quantité de produits tuber-leux (1 kilogramme de bacilles ou 1 litre de tuberculine brute) ne série de longues et laborieuses manipulations chimiques i les ont conduits à peu près aux mêmes résultats.

Laidlaw et Dudley sont parvenus à isoler une substance écifique sous forme d'une poudre blanche, soluble dans l'eau. s essais d'identification de ce produit leur ont permis de le nsidérer comme un complexe hydrocarboné du groupe des ntoses. Mis en contact avec un sérum précipitant de cheval, il nne encore une réaction nette en dilution à 1/6.000.000. uoique cette substance soit spécifiquement précipitable, on ne eut pas cependant la considérer comme un véritable antigène. ur elle ne provoque pas la formation d'anticorps et elle augmente pas le taux des anticorps du sérum des animaux nmunisés. D'autre part elle ne semble avoir rien de commun vec le principe actif de la tuberculine, car les intradermo-éactions effectuées chez les cobayes tuberculeux avec des solu-ons, même concentrées, restent toujours négatives.

(1) *British Journ. of Exper. Pathology*, t. VI, n° 4, 1925, p. 197.
(2) *Journ. of Exper. Medicine*, 1926, n° 1, p. 1-9.

Howard Mueller a recherché si la fraction de la tubercu responsable des réactions spécifiques chez le cobaye tubercul était, ou non, de nature protéique. Opérant d'abord avec d tuberculine brute, il a pu constater que les substances pr pitables diffèrent de celles qui provoquent les réactions in dermiques. Sous l'action des enzymes protéolytiques, la tul culine perd la propriété de donner des réactions cutan D'autre part, par acidification du précipité alcoolique, obtient un précipité donnant seulement la réaction cutar Si, par contre, le précipité alcoolique de la tuberculine est tr par l'acide tannique, il se forme une substance donnant forte réaction de floculation et pas de réactions cutanées.

Utilisant ensuite une tuberculine préparée sur un mil synthétique, il est parvenu, après de nombreuses précipitati alcooliques et acides, à isoler une substance précipitable par sérum spécifique en dilution à 1 p. 2.000.000, et ne provoqu pas de réaction cutanée en dilution à 1 p. 1.000. Elle conti 0,3 p. 100 d'azote, un peu de phosphore, et elle donne, com celle isolée par Laidlaw, les réactions typiques des hydrates carbone. Elle possède aussi la propriété de fixer le compléme Aussi Mueller conclut-il que la tuberculine ne peut pas ê titrée par les réactions de précipitation ou de fixation du co plément parce que, dans ces méthodes, interviennent facteurs différents de ceux qui déterminent les réactio cutanées.

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C. H. 477.

Geneva, December 1926.

LEAGUE OF NATIONS

HEALTH ORGANISATION

INTERNATIONAL HEALTH YEAR-BOOK

1925

(Second Year)

REPORTS

ON THE

Public Health Progress

OF

TWENTY-ONE COUNTRIES

Publications of the League of Nations

III. HEALTH
1926. III. 26.

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PREFACE TO THE FIRST ANNUAL VOLUME.

The Health Organisation of the League of Nations has already issued a numb handbooks dealing with the organisation of the public health services of diff countries, and several others are in course of preparation. The preparation of reports has in each case been entrusted to a specially qualified member of the H Administration concerned. These series of reports, when complete, will supply mation regarding national activities in all branches of public health endeavo detailed knowledge of which forms the basis of all effective international health

The development of public health activity, however, is rapid, and chang legislation and procedure are constantly taking place. For these reasons it has thought well to supplement the information contained in the handbook by the of an annual progress report, in which the more important developments durin preceding twelve months will be briefly reviewed.

In the preparation of this volume, the first of such progress reports, the H Organisation of the League of Nations has received the collaboration of the H Administrations of the twenty-two countries whose activities are described. this much valued assistance our best thanks are due.

The first issue of a report such as this must be more or less experimental. rience gained during its compilation has already indicated changes which might advantage be introduced in subsequent issues. In spite of imperfections, it is th that the information contained in this volume will prove of value and interest to H Administrations and workers in many countries.

HEALTH SECTION OF THE SECRETARIAT
OF THE LEAGUE OF NATIONS.

December 1925.

PREFACE TO THE SECOND ANNUAL VOLUME

ı introducing the second annual volume of our Year-Book, it is only necessary
a few words to the Preface to the first annual volume.
n attempt has been made to obtain as recent and detailed statistics as possible
movement of populations, and it is believed that to some extent the object
en attained ; it is true that the statistical data now published do not all refer
same period and are not as complete for certain countries as for others. These
nces, which are due to the stage of development reached by the statistical
s in the several countries and the variety of methods employed in collecting
ta, will only disappear as these methods are to some extent standardised.
ı collecting information on other subjects, it is proposed, for the third annual
e of the Year-Book, to use detailed forms to help the authors in their work
so ensure greater uniformity.
special effort has been made to extend the scope of the Year-Book so as to
e as many health administrations as possible. Readers will regret the absence
ar of reports from the health administrations of Canada and Greece, which have
prevented for purely technical reasons from preparing their reports in time.
ecessary steps have been taken to avoid the recurrence of such a contingency,
promise has already been obtained of co-operation from various States in Latin-
ca and from certain other non-European countries.
ı the present volume will be found the reports of certain international organi-
s which play an important part in public health, together with a special chapter
progress achieved in 1925 in industrial hygiene ; the material for this special
r has been supplied through the International Labour Office.

THE HEALTH SECTION OF THE SECRETARIAT
OF THE LEAGUE OF NATIONS.

ecember 1926.

AUSTRIA

REPORT PREPARED BY

THE AUSTRIAN HEALTH SERVICE

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I. GENERAL INTRODUCTION.

rea.

,833 square kilometers.

pulation.

ensus of March 7th, 1923 : 6,535,363.
stimated numbers in the middle of 1924 : 6,572,247.

rth Rate in 1924.

) GEOGRAPHICAL INCIDENCE OF BIRTHS ACCORDING TO THE RETURNS OF LEGITIMATE AND ILLEGITIMATE BIRTHS.

District	Total Births	Children born alive	Children still-born	Percentage of Still-births	Legitimate Children	Illegitimate Children
.. ..	28,781	27,796	985	3.42	23,545	5,236
Austria	31,027	30,167	860	2.77	25,971	5,056
Austria	22,635	21,664	971	4.29	17,592	5,043
rg	5,660	5,511	149	2.54	4,100	1,560
.. ..	25,374	24,395	979	3.86	17,957	7,417
ia	11,233	10,924	309	2.75	6,959	4,274
.. ..	8,268	8,122	146	1.77	6,874	1,394
berg	3,572	3,503	69	1.93	3,338	234
land	8,857	8,658	199	2.25	7,666	1,191
or Austria	145,407	140,740	4,667	3.22	114,002	31,405
er 1,000 inhabitants. .	22.25	21.54	0.71			

) SEASONAL INCIDENCE OF BIRTHS, SHOWING CHILDREN BORN ALIVE TILL-BIRTHS, ACCORDING TO THE RETURNS OF LEGITIMATE AND ILLEGITIMATE BIRTHS.

	Total Births	Children born alive	Children still-born	Percentage of Still-births	Legitimate Children	Illegitimate Children
arter	37,863	36,570	1,293	3.41	29,447	8,416
arter	37,806	36,650	1,156	3.06	29,740	8,066
arter	35,810	24,624	1,166	3.26	28,336	7,474
arter	33,928	32,876	1,052	3.10	26,479	7,479

4. *Mortality* (1924).

(a) INCIDENCE OF DEATHS BY GEOGRAPHICAL AREAS AND BY AGE-GROUI

	0-1 Month	0-1 Year	0-5 Years	5-15 Years	15-30 Years	30-50 Years	50-70 Years	Above 70 Years	Age unknown
Vienna	1,221	2,724	3,415	430	2,453	4,786	8,837	5,197	59
Lower Austria ..	1,699	3,622	4,545	410	1,506	2,283	5,192	5,977	11
Upper Austria ..	1,455	3,302	4,061	292	900	1,460	3,698	4,303	—
Salzburg	358	685	851	88	263	482	973	852	—
Styria	1,442	3,466	4,138	304	1,153	2,057	4,186	4,215	—
Carinthia	744	1,596	1,914	158	448	651	1,478	1,524	—
Tyrol	448	910	1,144	125	391	619	1,218	1,295	—
Vorarlberg	182	322	397	49	139	251	534	562	—
Burgenland . ..	639	1,429	1,752	127	379	554	1,081	1,456	—
Total for Austria	8,368	18,056	22,217	1,983	7,632	13,143	27,197	25,382	70

(b) SEASONAL INCIDENCE OF DEATHS BY AGE-GROUPS.

	0-1 Month	0-1 Year	0-5 Years	5-15 Years	15-30 Years	30-50 Years	50-70 Years	Above 70 Years	Age unknown
1st quarter	2,200	5,012	6,128	484	1,943	3,373	7,554	7,759	15
2nd quarter	2,094	4,801	5,873	541	2,170	3,469	6,943	6,338	17
3rd quarter	2,151	3,973	5,083	553	1,841	3,093	5,896	4,958	16
4th quarter	1,923	4,270	5,133	405	1,678	3,208	6,854	6,327	22
Number of deaths per 1,000 persons in the same age-group			4.00	1.95	4.29	7.17	25.13	109.76	—

(c) GEOGRAPHICAL INCIDENCE OF DEATHS DUE TO CHIEF CAUSES OF DEATH.

Cause of Death	Vienna	Lower Austria	Upper Austria	Salzburg	Styria	Carinthia	Tyrol	Vorarlberg	Burgenland
enital debility	780	822	730	236	470	226	288	119	488
rculosis	4,195	2,410	1,537	345	1,694	591	541	274	591
monia	2,043	1,323	995	265	1,087	448	412	125	492
heria	102	37	48	7	32	13	18	8	16
ping-cough	276	94	55	10	109	27	29	6	45
pox	—	—	—	—	—	—	—	—	—
tina	27	8	4	—	12	4	4	—	2
es	26	48	50	12	39	13	47	12	29
us	—	—	—	—	—	—	—	—	—
oid fever	70	50	26	12	50	10	8	3	14
tery	33	5	1	1	24	20	2	—	10
ic cholera	—	—	—	—	—	—	—	—	—
tile cholera	—	204	183	35	8	20	49	3	140
ra nostras	—	5	1	—	—	2	1	—	—
eral fever	87	38	30	1	51	16	14	3	11
æmic wound infections ..	269	306	247	37	227	89	77	15	51
infectious diseases ..	313	256	197	25	231	66	122	22	63
ious diseases of animal gin	4	10	2	1	4	—	2	—	—
lexy	1,595	1,055	830	194	949	206	265	117	123
ic diseases of the heart and ctions of the circulation .	4,572	2,721	2,021	489	2,158	721	350	218	560
nant tumours	2,900	1,795	1,325	348	1,196	393	437	187	203
natural causes of death ..	6,522	7,761	5,880	1,303	6,949	2,999	1,873	726	2,338
ent	493	510	371	131	411	204	178	61	107
le	825	416	163	49	332	94	69	32	54
cide	39	32	19	8	20	11	6	1	12
own causes	6	18	—	—	—	—	—	—	—
Total..	25,177	19,924	14,715	3,509	16,053	6,173	4,792	1,932	5,349

(d) SEASONAL INCIDENCE OF DEATHS DUE TO CHIEF CAUSES OF DEATH.

Causes of Death	Quarter				Total	Rate p 10,0 Inhabi
	1st	2nd	3rd	4th		
Congenital debility	1,091	1,070	1,032	966	4,159	6.3
Tuberculosis	3,297	3,598	2,658	2,625	12,178	18.6
Pneumonia	2,356	1,857	1,166	1,811	7,190	10.9
Diphtheria	109	62	40	70	281	0.4
Whooping-cough	116	221	197	117	651	0.9
Smallpox	—	—	—	—	—	—
Scarlatina	20	11	7	23	61	0.0
Measles	76	92	222	54	276	0.4
Typhus	—	—	—	—	—	—
Typhoid fever	45	71	56	61	243	0.3
Dysentery	27	28	35	6	96	0.1
Asiatic cholera	—	—	—	—	—	—
Infantile cholera	102	162	236	142	642	0.9
Cholera nostras	2	4	2	1	9	0.0
Puerperal fever	67	47	71	66	251	0.3
Septicæmic wound infections ..	311	323	327	357	1,318	2.0
Other infectious diseases ..	475	345	202	273	1,295	1.9
Infectious diseases of animal origin	8	2	8	5	23	0.0
Apoplexy	1,543	1,325	1,083	1,383	1,334	8.1
Organic diseases of the heart and affections of the circulation ..	4,045	3,569	3,093	3,103	13,810	21.1
Malignant tumours	2,202	2,115	2,202	2,265	8,784	13.4
Other natural causes of death ..	10,373	9,166	7,576	9,236	36,351	55.6
Accidents	553	630	732	551	2,466	3.7
Suicide	405	609	557	463	2,034	3.1
Homicide	29	37	38	44	148	0.2
Unknown causes	4	2	13	5	24	0.0
Total	27,256	25,356	21,385	23,627	97,624	149.

5. *Infant Mortality in* 1924.

(a) INCIDENCE OF INFANT MORTALITY BY GEOGRAPHICAL AREAS AND BY AGE-GROUPS.

(Rate per 100 children born alive.)

	0-1 Month	0-1 Year
Vienna	4.39	9.80
Lower Austria	5.63	12.01
Upper Austria	6.72	15.24
Salzburg	6.50	12.43
Styria	5.91	14.21
Carinthia	6.81	14.61
Tyrol	5.52	11.20
Vorarlberg	5.19	9.19
Burgenland	7.38	16.50

(b) INCIDENCE OF INFANT MORTALITY BY SEASONS AND BY AGE-GROUPS.

(Rate per 100 children born alive.)

	0-1 Month	0-1 Year
st quarter	6.01	13.70
nd quarter	5.71	13.10
rd quarter	6.21	11.47
th quarter	5.85	12.99
Rate for the year	5.95	12.83

udget.

FEDERAL CLOSED ACCOUNTS 1925.

Appropriations.

Social Administration.

	Receipts	Expenditure
	Schillings	
'ederal Ministry for Social Administration	72,659	1,493,553
ieneral social administration	101,564,614	176,792,614
'ublic Health	1,534,870	24,264,580
Repayments from previous years	6,000,000	—
Total IX	109,172,143	202,450,747

Detailed Items.

. *Public Health.*

	Receipts	Expenditure		
			Schillings	
'ederal institutions			219,759	312,726
'ederal hospital establishments			1,269,530	1,412,113
pecial items :				
(a) Anti-epidemic measures	7,328	90,003		
(b) Anti-tuberculosis measures	—	92,162		
(c) Measures against cutaneous and venereal diseases	—	71,088		
(d) Anti-alcoholic measures	—	11,160		
(e) Hospitals and nursing services	152	21,476,001		
(f) Sanitation measures, etc.	—	44,718		
(g) Technical training	—	1,184		
(h) Austrian Serum Company : rent for the Sero-therapeutic Institute	25,620	—		
(i) Miscellaneous receipts	591	—		
			33,691	21,786,316
ealth service in the Federated States for the political dministration : police medical service : school for aining of midwives			11,890	753,425
Total Public Health			1,534,870	24,264,580

II. HEALTH LEGISLATION.

1. *Dentistry.*

A Ministerial Decree of September 26th, 1925, *Federal Legal Gazette*, No. 38 down in detail the special training to be given to doctors desiring to practise dent It provides for a separate course of dentistry in each medical faculty for the s technical training of those doctors of medicine who wish to devote themselves practice of dentistry. This training, which is only open to doctors of medicine four terms and comprises theoretical and practical training in conservative, su and prosthetic dentistry, including technical laboratory work and orthodentia. of proficiency in these subjects must be given in a public examination held by a s examining board to be established at each university. The examination consi two written papers on the science of dentistry and of practical and theoretical t all the relevant subjects. The decree further contains regulations concernin procedure to be adopted for the examination, the subjects covered by the examin the marking system, the repetition of the examination in the event of failure, the ficate and the examination fees.

2. *Pharmacy.*

A Ministerial Decree of September 24th, 1925, *F.L.G.* No. 380, contains new lations for the manufacture and sale of medicinal specialities, thereby cancelli provisions hitherto in force in this matter (Administrative Regulations of A 26*th*, 1920, *Provincial Legal Gazette*, No. 420, and the decrees modifying this Ad trative Regulation dated October 7th, 1921, F.L.G. No. 545, August 5th, 1922, No. 592 and July 9th, 1923, F.L.G. No. 375).

According to the ordinances now in force, medicinal specialities must be stood to mean medicinal preparations manufactured for general sale by chem packings of uniform shape and content and only intended to be sold in chemists' directly to the consumer. They may only be placed upon the market with the au sation of the Federal Ministry for Social Welfare and must be furnished with a tered number. The decree contains detailed rules for judging pharmaceutical rations authorisation for the sale of which as medicinal specialities has been appli Application for authorisation to sell such preparations as medicinal speciali subject to definite conditions which are also determined in detail in the decree re to. If authorisation is refused, appeal may be made to the Federal Ministry for Welfare, and, if that department does not grant the authorisation without f proceedings, the case is dealt with by a special " Permanent Board of Appeal ". board must then submit a report to the Federal Ministry referred to, proposing the granting or refusal of the authorisation. The Federal Ministry, however, on the appeal as it thinks fit. The composition of the Board of Appeal and the m of voting are laid down in detail in the decree. It also makes provision for the i tion of medicinal specialities to ensure that their composition is always the same chemico-pharmaceutical laboratory of the Federal Ministry for Social Wel responsible for this inspection.

All puffing of patent medicines is forbidden.

'he Federal Law of April 3rd, 1925, *F.L.G.* No. 127, laid down that doctors of iacy, before practising as chemists, must have had at least one year's technical ig in a public pharmacy and have proved their proficiency by passing a practical ination.

'he existing regulations for the employment of assistants in pharmacies were led in several particulars by the *Ministerial Decree of July 28th*, 1925, *F.L.G.* 9, in order to bring them into line with other regulations on the same subject and ularly with the new decree regarding pharmaceutical studies and examinations, August 18th, 1922, F.L.G. No. 625. It would take up too much space to give tails, nor would they be of general interest : we must refer, therefore, to the text decree. We would only observe that Article XI has since been modified by the *terial Decree of June 22nd*, 1926, *F.L.G.* No. 158.

'urthermore, mention should be made of the *Ministerial Decree of March* 11th, *F.L.G.* No. 98, concerning the thirteenth list of the official price of drugs in the ian Pharmacopœia, Eighth Edition, and of March 11th, 1925, *F.L.G. No.* 99, rning the ninth official price list in the Austrian Pharmacopœia, Eighth Edition, ivileged bodies (rates for health insurance associations), which also contain regu- s affecting the basic law, and of the *Ministerial Decree of May 25th*, 1925, *F.L.G.* 72, modifying the pay schedule and the tariff of contributions to the Pharma- :al Salaries Fund in Austria.

Midwifery.

'he efforts of many years to arrive at a comprehensive settlement of the prin- of this question which would take account of the movement towards the estab- ent of a professional organisation of midwives resulted in the promulgation of *'ederal Law of July 2nd*, 1925, *F.L.G.* No. 214, regarding the regulation of mid- y. This law not only sought to codify and amplify the rules contained in the old ations but it also aims at raising the social status of midwives by improved train- nd by giving them an increased share in the duties connected with the care of c health and social welfare (maternity and infant welfare). As an economic equi- t for the new and higher standard of work demanded of midwives, their profession v given legal protection against overcrowding.

The law secures this protection by enacting that no midwife may practise her ssion in any place without having first obtained an official permit to settle in place whereby the authorities are enabled to adjust the number of midwives to l requirements (*cf.* letter (c) in the following paragraph) (exemption from the ation to obtain this special permit is only granted to midwives employed in public -in institutions, and provided they do not practise their profession outside the ution). In special cases, particularly when the necessary degree of reliability no r exists, the authorities are enjoined to withdraw the special permit ; in other , also laid down by law, the withdrawal of the permit is left to the discretion of uthorities, who must be guided by considerations of public welfare.

Midwives who require a permit in order to pursue their calling may be divided three groups :

(a) Midwives in public employment, *i.e.*, midwives whose services are retained by one or more communes and who (apart from exceptional cases) are *not* entitled to practise their profession outside these communes.

(b) Midwives employed in institutions.

(c) Independent midwives, who form the largest group. The entitled to exercise their profession not only in the place where they but anywhere in Austrian territory. To prevent the profession fr coming overcrowded, the authorities of each administrative district maximum number of midwives permitted to exercise their profession i district.

With the exception of those employed by special institutions, midwives are c to comply with all requests for their professional assistance, which includes mat and infant-welfare work.

The law created an innovation of importance, both in the public interests those of the profession, by the introduction of repetition courses, which all mi (except certain midwives attached to institutions) have to attend after a num years to be fixed by decree.

Even before the expiration of this period, however, midwives who fall bel required standard or show manifest incompetence in their calling, or who ha practised for two years, may be required to attend a repetition course.

For the purpose of upholding the prestige of the profession, improving its mic position and representing the common interests of midwives, this law c midwifery associations, to which all authorised midwives in a single Federal Stat belong. The detailed provisions regarding midwifery associations, particularly procedure, administration, accounts, their representation outside their own s the election of the association's committee and other such matters, were laid d the *Ministerial Decree of December 30th*, 1925, *F.L.G.* No. 13 ex 1926.

Each association of midwives determines its own internal procedure by me statutes.

4. *Destruction of Rats.*

The Federal Law of February 4th, 1925, *F.L.G.* No. 68 concerning the prev of the spread of diseases capable of being conveyed by rats, created a legal ba which the authorities could take measures for the systematic extermination o In order that the authorities may be in a position to enact such measures, own property as well as leaseholders and tenants are required to notify the local com authorities of any marked increase in rats on their properties. Similarly, the have to report anything they may notice in this connection. On the strength o notifications or reports, the political authorities of the district issue further ord the extermination of rats which, to ensure success, may also be extended to hou grounds not infested with rats. Further details regarding the authorities com in these matters, compulsory measures, costs, legal remedies and penalties m found in the text of the law.

5. *Notifiable Diseases.*

The Federal Law of December 3rd, 1925, *F.L.G.* No. 449 supplemented th demics Law of April 14th, 1913. *Imperial Legal Gazette*, No. 67, by including *paraty* among the diseases which by the latter law were made compulsorily notifiable the same time the penalties for failing to notify were substantially increased in or far as possible, to prevent notifiable cases from being concealed.

e *Ministerial Decree of April 29th*, 1925, *F.L.G.* No. 151, extended to the whole ria the limited obligation of notifying chickenpox which was laid down by the of June 16th, 1923, F.L.G. No. 329.

isions for Doctors, Nurses, etc., and Their Dependants.

e *Decree of the Federal Government of May 4th*, 1925, *F.L.G.* No. 161, established basis for the assessment of pensions and maintenance allowances which are or the future be granted to doctors or nurses disabled by their work in connection idemics or to the dependants of doctors and nurses who have died in that This decree also fixed the amount of the education grant, the orphans' s and the grant in the event of death.

ntrol of Foodstuffs.

ntion should be made of the following Ministerial Decrees :

ree of January 5th, 1925, *F.L.G.* No. 53, modifying the provisions of the Minis- ecree of May 25th, 1908, *German Legal Gazette* No. 155, concerning the length ses for the training of health and foodstuff control officers and concerning fees.

ree of January 5th, 1925, *F.L.G.* No. 54, fixing at ten schillings the examination e collected in virtue of the Ministerial Decree of May 25th, 1908, *Imperial azette* No. 156, from the special sworn officers appointed by autonomous cor- ns for the exercise of the health and foodstuff control.

ree of February 28th, 1925, *F.L.G.* No. 92, amending the Ministerial Decree of er 6th, 1924, F.L.G. No. 342, concerning the inspection of cattle and meat and le in meat, in one point (in Article 8, No. 10, Line 2, the words " complete ema- " should be replaced by " advanced degree of emaciation "), and fixing October 5, as the beginning of the period of operation of the Decree of 1924.

III. CAMPAIGN AGAINST SOCIAL DISEASES.

berculosis.

e organisations for combating tuberculosis were further developed during the 925.

o new anti-tuberculosis centres were established and Austria now possesses hese centres organised in accordance with the Ministerial Circular of 1917, o centres administered by sick-fund societies. The two centres recently opened h in Vienna, one of them being managed by the town of Vienna and the other Workers' Sickness Insurance Fund of the Viennese Merchants' Association.

DISTRIBUTION OF THE ANTI-TUBERCULOSIS CENTRES IN THE DIFFEREN PROVINCES 1925.

Province	Anti-tuberculosis Centres	Private Associations	Communes	Local Committees	Sickness Insurance Offices	In Un
Vienna	19	7	9	—	3	
Lower Austria ..	14	11	2	1	—	
Upper Austria ..	6	5	—	1	—	
Salzburg	2	2	—	—	—	
Styria	16	11	2	—	—	
Carinthia	2	1	—	1	—	
Tyrol	1	1	—	—	—	
Vorarlberg ..	1	1	—	—	—	
Total	61	39	13	3	3	

The reports for the year 1924 sent in by the 59 anti-tuberculosis centres by law to furnish returns have been examined. The general report compil these returns[1] shows the work of the anti-tuberculosis centres in a very fav light. The area covered by them was 17,433 square kilometers, or 20.9 per cen whole territory of Austria. They have to provide for a population of 3,677 habitants, or 56.4 per cent of the total population, according to the last censu proportion of the area and the population covered by the anti-tuberculosis varies greatly in different provinces. Whereas, in Vienna, the proportion is cent, in respect both of area and of population, the single anti-tuberculosis c the Tyrol (headquarters at Innsbruck), for instance, only covers 0.6 per cen area, and 21.6 per cent of the population, of the province. The differences in t covered and population served by the anti-tuberculosis centres are due partly number of centres existing in the various provinces, and partly to variation density of population.

TERRITORIAL EXTENT AND POPULATION OF THE AREA COVERED.

Province	Anti-Tuberculosis Centres	Size			Population	
		Territorial extent in sq. km.	Area covered in sq. km.		Total	Living in th covere
			Actual figure	Percentage		Actual number
Burgenland	—	4,028	—	0.0	286,299	—
Carinthia	2	9,551	444	4.6	370,432	61,209
Lower Austria	14	19,208	8,225	42.8	1,478,697	771,891
Upper Austria	6	11,982	1,444	12.0	873,702	238,302
Salzburg	2	7,153	268	3.7	222,731	80,159
Styria	16	16,373	6,606	40.3	977,350	580,503
Tyrol	1	12,399	69	0.6	313,699	67,637
Vorarlberg	1	2,602	99	3.8	139,968	14,394
Vienna	17	278	278	100.0	1,863,783	1,863,783
Total	59	83,574	17,433	20.9	6,526,661	3,677,878

[1] *The Anti-Tuberculosis Centres in Austria and their Work during* 1924, published by Julius Springer, Vienn

urgenland, which fell to Austria after the Peace of St. Germain, has as yet no ıberculosis centres of its own ; medical assistance to tuberculous patients , in that province, under general health work.

he total number of cases in 1924 was 127,780. The number of fresh admissions centres recorded was 29,634, or 0.8 per cent of the total population living in the served ; this figure included 3,279 (= 11.1 per cent) serious cases.

f the 29,634 new cases :

8,867 cases (= 29.9 per cent) were admitted on personal application ;
2,900 (= 9.8 per cent) were sent by medical practitioners ;
2,444 (= 8.2 per cent) by hospitals and sanatoria ;
5,889 (= 19.9 per cent) by sickness insurance funds ;
2,835 (= 9.6 per cent) by schools, and
6,699 cases (= 22.6 per cent) by other persons or institutions.

f the 29,634 newly admitted patients, 22,167 (or nearly 75 per cent) lived with amilies ; in only 21 per cent of the families was there a medical examination of all dividuals ; of the 4,816 persons so examined, 3,388 (*i.e.*, 70.3 per cent) were found tuberculous.

Number of medical examinations .. .. (31,808 persons examined for the first time.)	113,307
Number of bacteriological examinations of sputa .. .. (1,425 positive results = 19.4 per cent.)	7,355
Number of cases tested by Pircquet's skin reaction .. .. (3,791 positive results = 45.9 per cent.)	8,264
Number of radioscopic examinations	5,846

he work of the nursing staff is indicated by the number of home visits, 62,615 paid in the year 1924, including 17,765 first visits or visits of enquiry.

s regards popular tuberculosis sanatoria, the new Kuranstalt, with 108 beds, ened at Weyer in Upper Austria. It was built for its members by the Viennese Assistants' Sickness Insurance Fund, and opened towards the end of 1925. reuzwiese and Baumgätnerhöhe sanatoria in Vienna have been extended. On her hand, the " Spinnerin am Kreuz " sanatorium in Vienna, which was opened g the war, no longer serves as a tuberculosis institution.

he number of beds in sanatoria for tuberculosis (including surgical tuberculosis) l the convalescent homes (preventoria) intended exclusively for persons suffering and in danger of, tuberculosis totals 5,942 (including 4,136 in hospitals). In on to this, the town of Vienna possesses, outside Austrian territory, a convat home in Lussin Grande, Italy, with 60 beds, and a seaside hospital with 150 beds winter and 250 beds in the summer — that is to say, a further 210 to 310 beds. he number of hospital beds for tuberculosis at the end of 1925 may be reckoned 36.

DEATHS FROM TUBERCULOSIS.

	1922	1923	1924
umber of deaths from tuberculosis	16,765	13,464	12,178
ercentage of total deaths	14.74	13.48	12.47
eaths from tuberculosis per 10,000 inhabitants	20.6	20.6	18.7

The Federal Ministry for Social Welfare repeatedly drew attention, by mea circulars, to the need for close co-operation between the hospitals and sanatori the anti-tuberculosis centres, and instructed hospital and sanatoria authorities t immediate notice to the anti-tuberculosis centres, where available, of the disc of tuberculosis patients, in order that the care of such patients might be taker or resumed by the public health authorities immediately after their disch Furthermore, the observance of existing regulations on the compulsory notifi of tuberculosis was enjoined upon all concerned.

In a circular No. ZI. 11-864/1, dated April 9th, 1925, the Provincial Gover of Styria draws the attention of the administrative authorities and of their m officers to the dangers to which school-children are exposed by the presence of t culous teachers, and recommends that careful attention should be given to this n in school medical examinations and in the medical examination of teachers ap for sick leave. Teachers who suffer from open tuberculosis, or are still suspec be suffering from open tuberculosis after analysis, are to be immediately repor the local Educational Council as unsuitable, on health grounds, for the tea profession ; in any event, the prophylactic and therapeutic measures prescril individual cases must be taken forthwith, and, among other things, tea suspected of tuberculosis must, if possible, only be employed for teaching clas older puplsi.

2. *Venereal Disease.*

The campaign against venereal disease was carried on during 1925 in acco with the measures already mentioned in the 1924 *Year-Book*.

Owing to the imperative need for economy in Government expenditure, s the organisations for combating these diseases were in danger of curtailment.

The number of persons attending the evening dispensaries for indigent p suffering from venereal disease in Vienna during the year 1925 did not, on the differ appreciably from the number recorded for 1924. Some of the dispensaries provinces were, however, less frequented, so that the question of closing them can now be considered. In Vienna, there were nine such dispensaries, of whi only was financed by the city, whilst the others were supported exclusively by P funds. The total number of persons attending these nine dispensaries was Of these, 5,464 were found to be suffering from venereal disease, whilst in the case remaining 4,854, only skin diseases not attributable to venereal disease were diag At the consulting-room of the Town Health Office in Vienna, 589 persons examined and given advice, as compared with 254 in the preceding year.

The advisory office on marriage questions at the Town Health Office, whi serves, in some measure, to combat venereal disease by examining and giving on marriage to persons about to marry and to married persons, was visited persons.

The following particulars may be quoted from the report of the Vienna authorities on the supervision of prostitutes. At the end of 1925, a total n of 1,097 women were under the supervision of the special police authorities a number of registered prostitutes had decreased by 91 since 1924. In connectio raids carried out by the police with a view to detecting unregistered prost 768, or 17.2 per cent, of the 4,453 women stopped and questioned were found suffering from venereal disease (in 1924, 895, or 18.8 per cent, of the 4,752

ned were suffering from venereal disease) ; of the 4,453 mentioned, 387, or r cent, were minors (in 1924, out of the 4,752, 543, or 11.42 per cent, were minors), these, 119, or 30.7 per cent, were suffering from venereal disease (in 1924, out girls, 150, or 27.6 per cent, were suffering from venereal disease).

oholism.

decision of the Provincial Diet, the province of the Tyrol has enacted a pro- law of its own for the repression of drunkenness (Law dated January 10th, 1925, *l of Provincial Laws and Ordinances for the Tyrol*, Volume V, 1925).

cording to this law, persons who are known, as a result of legal or police court lings, to be inclined to disorderly behaviour when under the influence of drink, se tendency to drunkenness is attested by an official medical certificate, may idden to enter inns or public-houses. Furthermore, distilled liquors may neither ed nor retailed to such persons outside public-houses. These prohibitions are to the district in which the person concerned is living or its immediate neigh- od. The official lists of such persons must be posted up near the entrance of premises concerned. Infringements of such prohibitions are punishable with of from 10 to 100 schillings or with imprisonment not exceeding seven days. ements of the regulations by publicans or shopkeepers are punishable with a t exceeding 100 schillings. The right to issue such prohibitions and to punish ements is vested in the administrative authorities of the district ; in the case als, the Provincial Governor's decision is final.

the Faculty of Medicine at the University of Innsbruck, a new feature was ced in the winter term of 1925-26. The vice-principal having sought and d the consent of the Federal Ministry of Education, one hour per week is l to a lecture, open to students of all faculties, on " The Dangers of Alcoholism nereal Diseases ".

ring the year 1925, there was increased propaganda by the temperance tions.

June 1925, a new welfare bureau for drunkards, with one doctor and one woman ant, was opened at the Health Office of the city of Vienna. The number of s attending the bureau in the second half of 1925 was 457, including 193 new 41 per cent).

February and March 1925, the Viennese police authorities organised a series ires with the object of enlightening their staff on the nature of and the methods bating alcoholism.

e welfare work for persons in danger of becoming alcoholic addicts, organised Welfare Office at police headquarters, has been further extended in such a r that not only all cases of disorderly conduct by persons under the influence of ut all infringements of the criminal laws, all accidents to persons in a state of ation, and all assistance given to drunkards is recorded and published. In the 925, 13,071 cases of persons detained for drunkenness were recorded by the e Office on the basis of returns received. These included 2,850 cases of previous rs, so that the above 13,071 returns related only to 10,221 persons. The persons detained may be divided as follows :

(a) ACCORDING TO AGE.

Up to 20 years	325 (including 26 women).
From 21 to 30	3,354 (253 women).
From 31 to 40	2,972 (211 women).
From 41 to 50	2,102 (136 women).
Over 50 years	1,468 (119 women).

(b) ACCORDING TO PROFESSIONS.

(Statistics based on the District Industrial Committee's classification.

Agriculture and forestry	
Mining	
Blastfurnaces	
Gardening	
Stone, earthenware, pottery and glass industry	
Metal-working industry	
Machinery, apparatus, instrument and vehicle industry	
Woodworking and carving industry	
Rubber, gutta-percha and celluloid industry	
Workers in leather, hides, bristles, hair, feathers and similar materials	
Textile industry	
Paperhangers	
Clothing and millinery trades	
Paper industry	
Foodstuffs and beverage industry	
Hotels, etc.	
Chemical industry	
Building trade	
Printing trades	
Miscellaneous trades connected with various branches of industry	
Commerce	
Day labourers	
Transport workers	
Domestic service	
Free callings	
Miscellaneous (business men, public employees, pensioners, students, private individuals and persons without occupation)	
Total	

The fifteen welfare stations for persons in danger of becoming alcoholic (fourteen attached to district police headquarters and one attached to the Office) arranged 702 consultations with 8,136 persons in danger of b alcoholic addicts, but the number of persons actually attending was only 5 64 per cent.

The statistics compiled by the Welfare Office of cases in which perso taken into custody by the police in Vienna, and in which the abuse of alc shown to be a contributing factor, give the following figures for the year 192

Total number of persons proceeded against : 29,723 (1924 : 29,274) ;

Of which 19,450 were for drunkenness, *i.e.*, 65.44 per cent (20,359 in 19 69.54 per cent).

though the total number of persons proceeded against was greater in 1925 than
t, the number of cases of intoxication decreased.
ıe number of intoxicated persons fell in 1925, totalling 17,972, as against 18,761
t.
ı improvement, slight though it may be, was noticeable in the 1925 return
ng persons intoxicated. Their number fell from 730 in 1923, and 332 in 1924,
in 1925.

IV. CAMPAIGN AGAINST INFECTIOUS DISEASES.

he following cases of infectious diseases were officially reported during the year

carlet fever	5,758	Chickenpox	3,640
iphtheria	3,704	Trachoma	818
nteric	2,207	Poliomyelitis	5
aratyphoid	363	Encephalitis lethargica ..	3
ysentery	345	Anthrax	14
erebro-spinal meningitis	38	Tetanus	5
uerperal fever	443	Rabies	2
alaria	9		

here have been no cases of cholera, typhus or smallpox.
carlet fever is still on the increase; the disease appeared in single cases in a severer
han in the previous year. There has also been an increase in diphtheria.
nteric occurred in various places in an epidemic form.
ı the town of Neunkirchen, in Lower Austria, 103 cases were recorded. The
was the selling of milk in a house in which a bacillus-carrier lived.
n order to discover the sufferers and germ-carriers, a travelling bacteriological
ıtory was sent to Neunkirchen and succeeded in quickly stamping out the
nic entirely. There was a small epidemic of 28 enteric fever cases in Giesshübel,
Austria, the cause being an infected well.
'here was also an increase in enteric in the town of Graz, though it proved impos-
o discover the cause. There is some justification for the view that the spread
disease was due to the practice which still persists of employing cesspool refuse
anuring salad.
systematic expert investigation of the Federal Province of Burgenland resulted
discovery of numerous cases of trachoma among the inhabitants. Most of
cases dated from the war period. In 1925, 818 *fresh* cases were registered.
ler to cope with the infection, trachoma treatment stations have been established
ich the inhabitants are treated gratis by medical experts. The cost is borne by
'ederal Treasury.
'he State bacteriological diagnosis stations were also of considerable assistance
tecting infectious diseases during the year covered by the report. The results
ir work may be seen from the following table :

Place	Area of Activity	Cases exar
Vienna	Lower Austria and Burgenland	28,73
Linz	Upper Austria	20,58
Salzburg	Salzburg	3,98
Innsbruck	Tyrol and Vorarlberg	6,23
Klagenfurt	Carinthia	12,06
Graz	Styria	17,54

During the year 1925, the State Institute for the Preparation of Vaccines su 356,082 tubes of vaccine.

The Institute for Protective Vaccination against Rabies treated 803 perso the Hegyös Alivisatos method.

V. PREVENTIVE MEDICINE AND HYGIENE.

1. *Control of Foodstuffs.*

(a) *Mushrooms.*—The decree referred to in the 1924 Year-Book concernir authorisation to sell in the Vienna markets certain kinds of mushrooms which h to that time been prohibited proved a success during the year 1925. The list of rooms will therefore be extended, if only slightly, in the near future.

The Federal Ministry of Social Welfare is acting on the principle that th of mushrooms will only be officially allowed in the markets if not a single pro raised when the matter is discussed.

(b) *Meat.*—The Federal Ministry of Social Welfare has made every effo agreement with the Federal Ministry of Agriculture and Forestry, to give full to the Order of December 6th, 1924, concerning the inspection of cattle and mea the trade in meat (*Federal Legal Gazette*, No. 342) and the Order of October 6th, concerning the manufacture, sale and offering for sale of foodstuffs made fron pork, intended to be consumed without being boiled or roasted (*Federal Legal G* No. 377). It is gratifying to note that, in Innsbruck for instance, compu inspection for trichina has been introduced, and it may be confidently anticipated within a comparatively short time, measures based upon the most modern me of cattle and meat inspection will everywhere be applied in Austria.

(c) *"Austrian Foodstuffs Code."*—The discussions on the new edition o *Austrian Foodstuffs Code*, referred to in the 1924 Year-Book have been continue have resulted in the preparation of several chapters of this work, which are issued as annexes to the official communications of the National Public Health C It may be assumed that, during the year 1926, the principal foodstuffs and hous articles will be discussed and finally dealt with.

The necessity of placing regulations governing the sale of foodstuffs on an nationally recognised basis, which would serve as a guide to all foodstuff indu is making itself increasingly felt. In the view of the Federal Ministry of Welfare, *The Austrian Foodstuffs Code* is to be regarded as such a basis.

VI. THE TEACHING OF MEDICINE.

'he reforms in the curriculum of medical studies (regulations for doctor's degree) ıstrian universities have been in preparation for a considerable time. The e of professional training for doctors will thereby probably be extended from eleven half-yearly terms, the intention being to increase the amount of practical to be done by the candidates.

'he distribution of medical students over the three faculties of medicine of the ersities of Vienna, Graz and Innsbruck during the academic year 1924-25 can be from the following table.

Faculty of Medicine of the University of	Number of students in the : Winter Term 1924-25	Summer Term 1925	Academic Year 1924-25
ıa	2,600	2,261	4,861
.. ..	1,016	911	1,927
ruck	388	408	796
Total	4,004	3,580	7,584

eptember 1926.

BELGIUM

BY

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I. INTRODUCTION.

rea : 30,441 square kilometers.

he territory of Belgium is divided into the following provinces :

ovince	Number of Communes in 1920	Area on December 31st, 1920		
		Hectares	Ares	Centiares
rp	152	283,157	17	67
nt	346	328,296	95	34
rn Flanders	252	323,395	60	52
n Flanders	298	300,027	98	55
ut	444	372,165	89	77
.. ..	344	289,811	41	20
rg	206	240,766	7	75
nburg	231	441,812	42	00
r	365	366,025	96	34
ingdom	2,638	2,945,459	49	14

opulation : 7,744,259 on December 31st, 1924.

ccording to the 1920 census, the population of Belgium was distributed between communes, as follows :

361 of less than 5,000 inhabitants, totalling 3,145,890 inhabitants = 42.48 per

16 of between 5,000 and 15,000 inhabitants, totalling 1,696,660 inhabitants = per cent.

) of between 15,000 and 25,000 inhabitants, totalling 577,030 inhabitants = 7.79 nt.

) of between 25,000 and 50,000 inhabitants, totalling 650,406 inhabitants = 8.78 nt.

of between 50,000 and 100,000 inhabitants, totalling 447,588 inhabitants = 6.04 nt.

with 100,000 inhabitants or more, totalling 888,725 = 12 per cent.

n 1920, the density of population was 251 per square kilometer and varied from abitants (in the arrondissement of Neufchâteau) to 973 inhabitants (in the arron-ent of Brussels).

very year on December 31st the Administration of General Statistics, which is inate to the Ministry of the Interior and Health, estimates the number of the ation from data supplied by the official registers. An examination of these rs showed the population on December 31st, 1924, to have been as follows :

DISTRIBUTION OF POPULATION ACCORDING TO PROVINCE AND SEX (DECEMBER 31st, 1924).

Province	Males	Females	Total
Antwerp	537,312	546,308	1,083,620
Brabant	765,940	827,253	1,593,193
Western Flanders	423,714	435,599	859,313
Eastern Flanders	550,630	563,542	1,114,172
Hainaut	629,513	624,533	1,254,046
Liége	435,892	446,882	882,774
Limburg	165,644	158,181	323,825
Luxemburg	111,077	110,250	221,327
Namur	173,590	178,416	352,204
Eupen, Malmédy and St. Vith	29,266	30,519	59,785
The Kingdom	3,822,578	3,921,681	7,744,259

The distribution of the population according to age is calculated every t on the occasion of the general census. The following table shows this distrib December 31st, 1920, according to age-groups conforming with those acce statistics of disease by the International Commission entrusted with the revision of the international lists of diseases.

DISTRIBUTION OF THE POPULATION ACCORDING TO AGE (DECEMBER 31st, 19

Age-group	Males	Females	Total	Percentag group in to the popul
Less than 1 year	76,813	74,280	151,093	2
1 to 5 years	183,253	179,519	362,772	4
5 to 15 years	669,760	665,925	1,335,685	18
15 to 20 years	364,161	363,494	727,655	9
20 to 40 years	1,172,853	1,206,492	2,379,345	32
40 to 60 years	833,180	857,794	1,690,974	22
60 and over	344,968	413,807	758,775	10
Total	3,644,988	3,761,311	7,406,299	

The distribution of households per house is a matter of some interest.

On December 31st, 1920, the number of houses, including temporary d was 1,546,408. The number of households was 1,983,792. The increase in the of houses, which amounted to 15.56 per cent between 1900 and 1910, was still cent between 1910 and 1920, whereas during the same periods the households i by 18 and 8 per cent. These proportions exceed the rate of increase in the po The number of households per 100 houses was 128 in 1920 and steadily in whereas the number of inhabitants per 100 houses, which was 479 in 1920, is g diminishing.

The average number of persons composing a household has been falling si At that time it was 405, and in 1920 it was 373. This last figure is mainly d large number of marriages contracted immediately after the war.

With regard to the number of dwellings per 100 houses, it has been noted is increasing in the various categories of communes, but principally in the larg of population.

Households of one to four persons and dwellings with one to four rooms are in the ity.

Death Rate.

(a) GENERAL DEATH RATE.

The decrease in the general death rate has remained constant. The decline in the er of deaths is greatly influenced by the reduction in the birth rate.

The fall in the death rate is particularly conspicuous in the provinces of Antwerp, ern Flanders and Eastern Flanders, where the birth rate has also markedly ed.

The total number of deaths amounted, in 1924, to 99,653—51,550 being males and 3 females, thus giving a proportion of 51.73 per cent of deaths for the former, and per cent for the latter.

The death rate of men is always higher than that of women, while the male popu- is smaller; the death rate of men is, however, tending to become more nearly with that of women.

t is known that the number of male children born is higher than that of female en, and that a greater number of male children die in early infancy than female en. The gradual fall in the birth rate may therefore to some extent explain henomenon.

(b) DEATH RATE ACCORDING TO SEX, WITH PRINCIPAL CAUSES.

The service for the medical certification of deaths is not legally organised and exists, in fact, in a small number of the larger towns and communes. The result is tatistics of the causes of death cannot lay claim to mathematical accuracy. At me time, the constant recurrence observed from year to year in the facts recorded rs upon the information supplied — if not all the value that is desirable — a value although relative, is nevertheless worthy of consideration.

The following table gives for each sex the total number of deaths in 1924 with the us causes and the importance of each cause to the whole.

STRIBUTION OF DEATHS ACCORDING TO SEX AND PRINCIPAL CAUSES IN 1924.

Causes of Death	Males	Females	Total	Proportion per 10.000 inhabitants
eneral Diseases :				
Epidemic, endemic and infectious :				
Typhoid Fever	136	135	271	0.35
Typhus	—	—	—	—
Malaria and Malarial Cachexy	13	10	23	0.03
Smallpox	9	7	16	0.02
Measles	482	252	534	0.70
Scarlet Fever	86	63	149	0.19
Whooping-cough	472	452	924	1.20
Diphtheria or Croup	149	110	259	0.34
nfluenza	1,075	1,028	2,103	2.74
Asiatic Cholera	—	—	—	—
Choleriform Enteritis	87	90	177	0.23
Tuberculosis of the Respiratory Organs	2,771	2,649	5,420	7.05
Tuberculosis of the Meninges or of the Central Nervous System	397	421	818	1.06

Causes of Death	Males	Females	Total	Propor 10, inhab
Other Forms of Tuberculosis	856	840	1,696	2.2
Epidemic Cerebro-spinal Meningitis	121	129	250	0.3
Rabies	—	—	—	—
Tetanus	53	29	82	0.1
Unspecified	142	151	293	0.3
(b) Not mentioned above :				
Cancer and other Malignant Tumours	2,806	3,408	6,214	8.0
Rheumatism	320	306	626	0.8
Diabetes	402	442	844	1.1
Acute Alcoholism	114	33	147	0.1
Other General Diseases	637	520	1,157	1.5
II. Affections of the Nervous System and Sensory Organs :				
Meningitis	918	833	1,761	2.2
Hæmorrhage	1,791	1,823	3,614	4.7
Other Affections	1,586	1,407	2,993	3.9
III. Affections of the Circulatory System:				
Diseases of the Heart (not including Angina Pectoris)	6,193	6,749	12,942	16.8
Other Affections	1,075	937	2,012	2.6
IV. Affections of the Respiratory Organs :				
Acute Bronchitis (including Unspecified Forms of Bronchitis of less than five years' duration)	1,156	962	2,118	2.7
Chronic Bronchitis (including Unspecified Forms of Bronchitis of more than five years' duration)	1,315	984	2,299	2.9
Pneumonia	3,542	3,183	6,725	8.7
Other Affections (excepting Phthisis)	1,507	1,171	2,678	3.4
V. Affections of the Digestive Organs :				
Affections of the Stomach (excepting Cancer)	853	683	1,536	2.0
Diarrhœa and Enteritis (under two years)	1,478	1,266	2,744	3.5
Diarrhœa and Enteritis (two years and over)	354	326	680	0.8
Appendicitis and Typhlitis	281	222	503	0.6
Hernia, Intestinal Obstruction	463	419	882	1.1
Cirrhosis of the Liver	499	415	914	1.1
Other Affections (excepting Cancer and Tuberculosis)	486	544	1,030	1.3
VI. Non-venereal Diseases of the Genito-urinary System and its Annexes :				
Acute or Chronic Nephritis	759	512	1,271	1.6
Non-cancerous Tumours and other Diseases of the Female Genital Organs	—	483	483	0.6

Causes of Death	Males	Females	Total	Proportion per 10.000 inhabitants
Puerperal Affections :				
uerperal septicæmia (Puerperal Fever, Peritonitis and Phlebitis)	—	478	478	0.62
ther Puerperal Accidents attending Pregnancy and Confinement	—	410	410	0.53
Congenital Weakness	1,693	1,483	3,176	4.13
enile Decay	4,653	5,504	10,157	13.23
)ther Diseases	4,215	3,493	7,708	10.02
eaths from Unknown or Insufficiently iagnosed Diseases :				
udden Death due to Unknown Causes ..	496	293	789	1.03
auses of Death not specified or insufficiently determined	2,165	1,727	3,892	5.07
Deaths from External Causes :				
omicide	146	42	188	5.02
uicide	773	275	1,048	
ccidents	2,074	380	2,454	
oubtful Cases	141	24	165	
Total	51,550	48,103	99,653	129.69

(c) DEATHS ACCORDING TO AGE-GROUPS AND PROVINCES, 1924.

he distribution of deaths according to age-groups determined in accordance ie recommendations adopted at its 1920 session by the International Commission, revises every ten years the International List of Diseases, for the year 1924 is as :

Province	Under 1 year	1 to 5 years	5 to 15 years	15 to 20 years	20 to 40 years	40 to 60 years	60 years and over	Total
werp	2,250	716	259	326	1,544	2,172	5,108	12,375
bant	2,433	784	353	447	2,507	4,068	8,972	19,564
tern Flanders ..	2,241	655	266	276	1,268	1,720	5,176	11,602
tern Flanders	2,290	692	363	322	1,639	2,131	6,930	14,367
naut	1,613	520	262	349	2,158	3,676	8,785	17,363
ge	1,154	397	213	268	1,439	2,411	6,020	11,902
burg	844	258	132	109	611	566	1,642	4,162
emburg	288	111	56	57	359	473	1,679	3,023
nur	505	161	93	98	684	945	2,809	5,295
Kingdom	13,618	4,294	1,997	2,252	12,209	18,162	47,121	99,653
ative size of each roup	13.67%	4.30%	2.04%	2.25%	12.25%	18.21%	47.28%	100%
en, Malmédy, and St. ith	116	37	22	19	95	113	428	830

omparing this table with those of former years, we find that the diminution number of deaths among new-born infants remains constant, and appreciably the reduction in the total number of deaths. The natural consequence is an se in the percentage of deaths among adults. A closer study of the figures for per age-group shows that the increased death rate among adults is in relation increase in the proportion of adults to the total population.

tatistics of deaths per age-group combined with the different causes of death ly established every five years. The following table for 1920 is the latest it has been possible to draw up on these lines.

(d) NUMBER OF DEATHS ACC

NAME OF DISEASE (Cause of Death)	AGE OF DECEASED				
	Under 1 year		1 to 2 years		5
	Male	Female	Male	Female	Ma
General Diseases.					
Typhoid Fever	11	2	1	—	
Intermittent Fever and Malarial Cachexy	16	16	5	—	
Smallpox	12	11	2	2	
Measles	250	190	64	68	
Scarlet Fever	74	76	23	11	
Whooping-cough	477	424	82	95	
Diphtheria and Croup	138	93	66	35	
Influenza	366	217	66	63	
Asiatic Cholera	—	—	—	—	
Cholera Nostras	1	5	—	—	
Other Epidemic Affections	45	31	8	5	
Rabies	—	—	—	—	
Pulmonary Tuberculosis	75	57	19	12	
Tuberculosis of the Meninges	47	37	8	8	
Other Tuberculous Affections	27	19	6	6	
Acute or Chronic Alcoholism	—	—	—	—	
Cancer and other Malignant Tumours	24	13	3	2	
Diseases of the Nervous System and Sensory Organs.					
Simple Meningitis	394	248	86	66	
Congestion, Hæmorrhage and Softening of the Brain	115	77	14	17	
Organic Diseases of the Heart	31	24	3	5	
Diseases of the Respiratory Organs.					
Acute Bronchitis	383	289	64	54	
Chronic Bronchitis	61	61	16	14	
Bronchial Pneumonia	739	520	141	140	
Pneumonia	377	242	74	60	
Diseases of the Digestive Organs.					
Affections of the Stomach (except Cancer)	67	51	4	3	
Diarrhœa and Enteritis (under 2 years)	2,314	1,663	177	177	
Appendicitis and Typhlitis	9	1	—	—	
Hernia, Intestinal Obstructions	87	51	6	5	
Cirrhosis of the Liver	8	2	—	1	
Diseases of the Genito-urinary System and its Annexes.					
Acute Nephritis and Bright's Disease	7	3	—	2	
Non-cancerous Tumours and other Diseases of the Female Genital Organs	—	—	—	—	
Puerperal Affections.					
Puerperal Septicæmia	—	—	—	—	
Other Puerperal Accidents in Pregnancy and Confinement	—	—	—	—	
Senility.					
Senile Decay	—	—	—	—	
Other Causes of Death	1,478	1,119	156	119	
Total	**7,633**	**5,542**	**1,094**	**910**	
Congenital Debility, Jaundice, Scleroma and Malformations	—	—	—	—	
Deaths from Unknown or Insufficiently Determined Causes.					
Sudden Death	—	—	—	—	
Causes of Death not specified or insufficiently determined	—	—	—	—	
Affections from External Causes.					
Death by Violence	—	—	—	—	
Grand Total	—	—	—	—	

AND PRINCIPAL CAUSES 1920

	AGE OF DECEASED										
	7 to 15 years		15 to 21 years		21 to 50 years		50 and over		TOTAL		
nale	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Total
4	16	21	54	51	133	104	38	20	261	208	**469**
—	1	—	2	—	5	7	9	8	39	32	**71**
—	—	1	1	1	3	1	1	7	22	23	**45**
11	5	7	—	—	—	2	—	—	379	315	**694**
12	12	16	5	8	12	11	1	5	168	148	**316**
14	6	3	2	—	—	1	—	2	627	588	**1,215**
70	68	75	13	13	22	25	110	7	479	405	**884**
49	81	83	76	70	391	307	411	510	1,513	1,376	**2,889**
—	—	—	—	—	—	—	—	—	—	—	—
—	—	2	5	1	6	2	10	13	24	25	**49**
3	7	13	13	12	65	55	67	81	218	206	**424**
—	—	—	—	—	2	4	7	13	9	17	**26**
30	89	209	416	534	1,909	1,916	699	551	3,238	3,332	**6,570**
19	27	42	34	38	92	75	60	50	307	293	**600**
10	45	51	68	77	305	298	200	202	679	679	**1,358**
—	—	—	—	—	35	17	89	35	124	52	**176**
1	15	12	17	32	465	685	1,908	2,319	2,448	3,071	**5,519**
52	148	158	89	69	209	162	199	160	1,286	1,005	**2,291**
8	27	29	35	36	426	352	2,666	2,562	3,311	3,098	**6,409**
7	52	69	75	59	569	695	4,134	4,852	4,887	5,725	**10,612**
9	23	21	22	15	136	103	366	365	1,030	895	**1,925**
6	28	28	28	28	237	195	876	736	1,278	1,076	**2,354**
35	58	74	72	79	497	373	1,167	1,229	2,811	2,545	**5,356**
35	59	95	134	106	692	559	1,343	1,489	2,772	2,638	**5,410**
3	10	8	13	9	192	150	660	599	951	834	**1,785**
—	—	—	—	—	—	—	—	—	2,491	1,780	**4,271**
3	24	23	24	17	70	74	75	71	208	190	**398**
10	10	10	22	11	128	122	290	317	558	532	**1,090**
1	4	3	4	2	90	80	342	340	450	429	**879**
6	20	16	21	13	210	151	498	320	766	517	**1,283**
—	—	1	—	17	—	260	—	226	—	504	**504**
—	—	—	—	35	—	376	—	18	—	429	**429**
—	—	—	—	37	—	506	—	25	—	568	**568**
—	—	—	—	—	—	—	5,073	6,188	5,073	6,188	**11,261**
78	196	175	226	141	1,603	1,191	2,944	2,805	6,831	5,758	**12,589**
476	1,031	1,245	1,471	1,511	8,504	8,859	24,143	26,125	45,238	45,481	**90,719**
—	—	—	—	—	—	—	—	—	1,909	1,495	**3,404**
—	—	—	—	—	—	—	—	—	367	232	**599**
—	—	—	—	—	—	—	—	—	2,143	1,833	**3,976**
—	—	—	—	—	—	—	—	—	3,030	777	**3,807**
—	—	—	—	—	—	—	—	—	52,687	49,818	**102,505**

(e) GEOGRAPHICAL DISTRIBUTION OF DEATHS, 1924.

Province	Total Deaths Males	Females
Antwerp	6,447	5,928
Brabant	9,926	9,638
Western Flanders	5,844	5,758
Eastern Flanders	7,206	7,161
Hainaut	9,162	8,201
Liége	6,253	5,649
Limburg	2,257	1,905
Luxemburg	1,668	1,355
Namur	2,787	2,508
The Kingdom	51,550	48,103
Total	99,653	
Eupen, Malmédy and St. Vith	407	423

(f) SEASONAL DISTRIBUTION OF DEATHS IN THE DIFFERENT PROVINCES OF BELG

For the annual totals, see *(e)* above.

Province	January		February		March		April		May	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Antwerp	625	645	716	621	737	689	590	528	560	465
Brabant	907	992	964	921	1,069	1,049	946	832	799	775
Western Flanders	580	577	612	596	685	674	527	483	467	478
Eastern Flanders	718	744	740	766	869	832	620	623	579	561
Hainaut	871	776	905	806	983	920	889	791	822	689
Liége	595	547	579	532	684	612	518	515	504	469
Limburg	203	185	188	194	242	224	247	168	190	179
Luxemburg	143	120	143	141	163	138	173	116	157	110
Namur	250	234	287	281	316	241	262	253	245	231
The Kingdom	4,892	4,820	5,134	4,858	5,748	5,379	4,772	4,309	4,323	3,957
Eupen, Malmédy, and St. Vith	41	35	33	27	54	45	45	40	36	36

Province	July		August		September		October		November	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Antwerp	441	392	396	382	420	409	460	394	503	464
Brabant	694	669	710	664	674	613	779	794	790	769
Western Flanders	450	424	422	351	367	408	410	408	441	471
Eastern Flanders	455	470	484	488	491	466	518	533	589	577
Hainaut	641	584	621	507	633	543	598	653	706	633
Liége	443	401	462	381	427	427	481	418	505	465
Limburg	147	130	168	126	168	109	157	123	196	154
Luxemburg	128	102	114	99	117	101	120	96	136	95
Namur	203	168	194	156	207	161	194	177	197	196
The Kingdom	3,602	3,340	3,571	3,154	3,504	3,237	3,717	3,596	4,063	3,824
Eupen, Malmédy, and St. Vith	28	30	28	23	25	26	28	35	33	34

fant Mortality.

(a) INFANT MORTALITY, 1921-24.

Year	Deaths under one year of age Actual Number	Percentage of total Deaths	Proportion per 100 Births
1921	18,833	18.31	11.53
1922	16,437	15.42	10.70
1923	14,483	14.47	9.31
1924	13,618	—	8.88

fants furnish a high proportion of deaths ; nevertheless, the death rate among is decreasing. This fact may be attributed to various causes, the chief of which reduction in the number of births, sanitary improvements, propaganda, etc. mpared with former years, 1921 is remarkable for the large number of deaths nfantile diarrhœa and enteritis.

NFANT MORTALITY ACCORDING TO AGE-GROUPS, NOT INCLUDING STILL-BIRTHS AND OTHER INFANTS DYING BEFORE REGISTRATION, 1924.

he total deaths under one year, the total births and the proportion per 100 births, see *(f)* on the following page.)

ince	Less than one Day (24 hours) old		Between 1 and 2 Days		Between 2 and 3 Days		Between 3 and 5 Days		Between 5 and 10 Days		Between 10 and 15 Days		Between 15 and 20 Days	
	Deaths	‰ of Births	Deaths	‰ of Births	Deaths	‰ of Births	Deaths	‰ of Births	Deaths	‰ of Births	Deaths	‰ of Births	Deaths	‰ of Births
. .. .	24	1.00	54	2.26	69	2.88	77	3.22	132	5.52	89	3.72	70	2.93
. .. .	32	1.34	73	3.05	87	3.64	95	3.89	130	5.44	103	4.31	78	3.26
ers	42	2.01	60	2.87	55	2.63	59	2.82	102	4.88	96	4.59	83	3.97
ers	29	1.25	56	2.47	56	2.47	60	2.58	116	4.99	92	3.96	86	3.70
. .. .	28	1.29	58	2.68	62	2.87	83	3.84	84	3.88	84	5.88	70	3.24
. .. .	18	1.26	42	2.95	45	3.16	55	3.86	81	5.69	76	5.34	49	3.44
. .. .	27	2.74	27	2.74	20	2.03	31	3.15	37	3.76	32	3.25	20	2.03
. .. .	8	1.82	14	3.18	16	3.63	6	1.36	22	4.99	10	2.27	12	2.73
. .. .	15	2.30	27	4.14	25	3.83	14	2.15	29	4.45	21	3.22	15	2.30
. .. .	223	1.45	411	2.68	435	2.84	478	3.11	733	4.78	603	3.94	483	3.15
ly and St. Vith	14	9.88	9	6.35	5	3.53	1	0.76	3	2.11	5	3.53	7	4.94

ince	Between 20 and 25 Days		Between 25 Days and 1 Month		Between 1 and 2 Months		Between 2 and 3 Months		Between 3 and 6 Months		Between 6 Months and one Year	
	Deaths	‰ of Births	Deaths	‰ of Births	Deaths	‰ of Births	Deaths	‰ of Births	Deaths	‰ of Births	Deaths	‰ of Births
. .. .	62	2.60	75	3.14	265	11.08	241	10.09	504	21.09	588	24.60
. .. .	50	2.09	84	3.51	261	10.92	263	11.01	547	22.87	632	26.45
ers	69	3.29	49	2.34	183	8.75	213	10.09	547	26.15	683	32.65
ers	81	3.48	52	2.24	294	12.64	272	11.70	506	21.75	590	25.35
. .. .	44	2.03	37	1.71	173	8.01	143	6.61	315	14.58	432	19.99
. .. .	31	2.18	20	1.47	100	7.03	103	7.14	224	15.75	310	21.80
. .. .	25	2.54	41	4.16	66	6.70	92	9.34	177	17.98	249	25.30
. .. .	11	2.50	4	0.91	33	7.50	22	4.99	45	10.20	85	19.13
. .. .	12	1.84	4	0.61	41	6.29	42	6.44	113	17.34	147	22.55
. .. .	385	2.51	366	2.39	1,416	9.24	1,391	9.08	2,978	19.45	3,716	24.27
ly and St. Vith	2	1.45	2	1.45	8	5.64	15	10.58	17	12.—	28	19.76

the above table no account is taken of still-births or of infants dying before ation. In order to obtain the exact number of infants who have lived but died the first year of birth, it is necessary to add to these figures the number of dying before registration (see note on Still-births).

(c) DEATHS OF CHILDREN UNDER 3 DAYS OLD ACCORDING TO PROVINCES,

Province	Deaths within 3 Days of Birth	Children born Dead	Total
Antwerp	147	213	360
Brabant	192	149	341
Western Flanders	157	176	333
Eastern Flanders	141	118	259
Hainaut	148	64	212
Liége	105	71	176
Limburg	74	72	146
Luxemburg	38	38	76
Namur	67	44	111
The Kingdom	1,069	945	2,014

(d) INFANT MORTALITY UNDER 1 YEAR OF AGE ACCORDING TO SEX, 19

Province	Boys			Girls	
	Deaths	Births	Proportion per 100 Births	Deaths	Births
Antwerp	1,259	12,195	10.3	991	11,723
Brabant	1,378	14,436	9	1,055	13,805
Western Flanders	1,185	10,753	11	1,056	10,170
Eastern Flanders	1,274	12,001	10.6	1,016	11,371
Hainaut	941	10,969	8.5	672	10,679
Liége	665	7,268	9.1	489	6,963
Limburg	480	5,021	9.5	364	4,824
Luxemburg	174	2,268	7.7	114	2,173
Namur	294	3,347	8.8	211	3,172
The Kingdom	7,650	78,258	9.7	5,968	74,880
Eupen, Malmédy and St. Vith	68	715	9.5	48	702

(e) INFANT MORTALITY ACCORDING TO PRINCIPAL CAUSES OF DEATH, 192

The Belgian General Statistical Service only establishes a list of causes according to age-groups every five years. With regard to infant mortality, th returns merely state the total number of deaths under two years of age from or enteritis.

1924 : Total number of deaths 99,653.

Deaths from diarrhœa and enteritis of children under two years of age, 2,7 per cent of total deaths.

(f) GEOGRAPHICAL DISTRIBUTION OF INFANT MORTALITY, 1924.

Province	Live births	Deaths under 1 year	Proportio per 100 birth
Antwerp	23,918	2,250	9.41
Brabant	28,241	2,433	8.62
Western Flanders	20,923	2,241	10.71
Eastern Flanders	23,372	2,290	9.80
Hainaut	21,648	1,613	7.45
Liége	14,231	1,154	8.11
Limburg	9,845	844	8.57
Luxemburg	4,441	288	6.48
Namur	6,519	505	7.75
The Kingdom	153,138	13,618	8.89

ıe infant mortality coefficient differs according to provinces : the Flemish pro- and particularly Western Flanders generally show the largest infant mortality Nevertheless, the decrease in infant mortality is noticeable in all the provinces.

(g) INFANT MORTALITY ACCORDING TO LEGITIMACY, 1924.

ınce	Legitimate Children			Illegitimate Children		
	Deaths under 1 year of age	Births	Percentage	Deaths under 1 year of age	Births	Percentage
rp	2,081	22,573	9.2	169	1,345	12.5
ıt	2,083	26,116	7.9	350	2,125	16.5
·n Flanders	2,134	20,247	10.5	107	676	15.8
n Flanders	2,121	22,368	9.4	169	1,004	16.8
ıt	1,470	20,278	7.2	143	1,370	10.4
.. ..	1,000	13,320	7.5	154	911	16.9
rg	815	9,564	8.5	29	281	10.4
ıburg	272	4,345	6.2	16	96	16.6
r	485	6,299	7.7	20	220	9.1
ingdom	12,461	145,110	8.6	1,157	8,028	14.4
, Malmédy & St. Vith	112	1,401	8.0	4	16	25.0

he infant mortality coefficient is higher among illegitimate children than among ıate. Up to 1923, both figures were steadily decreasing, but more quickly among mate than among legitimate children. In 1924, the infant mortality figure for ıate children continued to fall, while the figure for illegitimate children showed rease.

irth Rate.

NUMBER AND RATE OF BIRTHS (NOT INCLUDING STILL-BIRTHS AND OTHER CHILDREN DYING BEFORE REGISTRATION), 1921-24.

Year	Actual Figures	Births per 1,000 Inhabitants
1921	163,333	21.8
1922	153,611	20.3
1923	155,474	20.4
1924	153,138	19.9

EOGRAPHICAL DISTRIBUTION OF BIRTHS (NOT INCLUDING STILL-BIRTHS AND OTHER CHILDREN DYING BEFORE REGISTRATION), 1924.

Province	Boys	Girls	Totals
Antwerp	12,195	11,723	23,918
Brabant	14,436	13,805	28,241
Western Flanders	10,753	10,170	20,923
Eastern Flanders	12,001	11,371	23,372
Hainaut	10,969	10,679	21,648
Liège	7,268	6,963	14,231
Limburg	5,021	4,824	9,845
Luxemburg	2,268	2,173	4,441
Namur	3,347	3,172	6,519
The Kingdom	78,258	74,880	153,138
Eupen, Malmédy and St. Vith ..	715	702	1,417

(c) TOTAL NUMBER AND RATE OF BIRTHS PER PROVINCE, 1921-24.

Province	Year				Births per Thousand I		
	1921	1922	1923	1924	1921	1922	192
Antwerp	25,632	23,298	24,603	23,918	25.0	22.5	23
Brabant	30,076	28,402	28,652	28,241	19.6	18.2	18
Western Flanders	20,704	20,881	21,442	20,923	25.4	24.9	25
Eastern Flanders	25,480	24,135	24,171	23,372	23.0	21.7	21
Hainaut	24,423	22,161	21,558	21,648	19.9	17.9	17
Liége	16,014	14,643	14,224	14,231	18.5	16.8	16
Limburg	9,213	8,971	9,638	9,845	30.5	29.0	30
Luxemburg	4,715	4,532	4,540	4,441	21.1	20.4	20
Namur	7,076	6,588	6,646	6,519	20.3	18.8	19
The Kingdom	163,333	153,611	155,474	153,138	21.9	20.3	20

It should be mentioned that between 1881 and 1913 the birth rate co showed a remarkable decline. During the war the number of births fell from year, so that in 1918 only 86,056 births were recorded for the whole kingdom. 1919 onwards, there was a certain rise, shortly afterwards followed by decline, which continued between 1922 and 1924. The birth rate is highe Flemish provinces; the decline in the birth rate is to be observed in all the pr but chiefly in those of Antwerp and Eastern Flanders.

(d) NUMBER OF LEGITIMATE AND ILLEGITIMATE BIRTHS ACCORDING TO SEX AND PROVINCE, 1924.

Province	Legitimate Births		Illegitimate Births	
	Boys	Girls	Boys	Girls
Antwerp	11,549	11,024	646	699
Brabant	13,363	12,753	1,073	1,052
Western Flanders	10,398	9,849	355	321
Eastern Flanders	11,510	10,858	491	513
Hainaut	10,278	10,000	691	679
Liége	6,844	6,476	424	487
Limburg	4,878	4,686	143	138
Luxemburg	2,211	2,134	57	39
Namur	3,244	3,055	103	117
The Kingdom	74,275	70,835	3,983	4,045
Eupen, Malmédy and St. Vith	709	692	6	10

Legitimate births account for 94 per cent of total births.

(e) STILL-BIRTHS.

Belgian statistics give data relating to the birth rate and still-birth rat three distinct headings :

(1) Births ;
(2) Still-births proper ;
(3) Children dying before registration but having lived.

The heading " Births " comprises children born alive and duly registered three days of the confinement.

till-births proper are children delivered dead from the mother's womb any time six months' gestation.

hildren " presented dead " are children born alive but who died within the first days (general holidays excluded) following confinement and whose birth has not notified before their death.

uch children are not registered under births, but are entered immediately on gister of deaths ; no account is taken of them in determining the birth rate as in the foregoing tables. In order, therefore, to establish the exact number ths, it is necessary to add to the figures showing the total of live-born children ered under births the number of still-births proper and of children "presented ".

(f) GENERAL STILL-BIRTH RATE, 1924.

Province	Live Births		Still-births proper	Total Births	Percentage of total Births
	Children registered under Births	Children dying before registration			
erp	23,918	213	818	24,949	3.28
nt	28,241	149	1,170	29,560	3.96
rn Flanders	20,923	176	705	21,804	3.23
rn Flanders	23,372	118	854	24,344	3.51
aut	21,648	64	1,067	22,779	3.84	
	14,231	71	687	14,989	4.59
urg	9,845	72	304	10,221	2.97
mburg	4,441	38	167	4,646	3.59
ur	6,519	44	306	6,869	4.45
Kingdom	153,138	945	6,078	160,161	3.80
n, Malmédy and St. Vith	1,417	20	41	1,478	2.78

(g) STILL-BIRTH RATE OF LEGITIMATE CHILDREN, 1924.

Province	Legitimate Live Births		Legitimate Still-births proper	Total Legitimate Births	Proportion of Legitimate Still-births per 100 Legitimate Births
	Children registered under Births	Children dying before registration			
verp	22,573	200	756	23,529	3.22
ant	26,116	123	1,029	27,268	3.78
tern Flanders	20,247	164	656	21,067	3.12
ern Flanders	22,368	109	803	23,280	3.45
aut	20,278	60	963	21,301	4.52
e	13,320	67	621	14,008	4.41
burg	9,564	70	291	9,925	2.93
emburg	4,345	37	159	4,541	3.50
ur	6,299	43	281	6,623	4.24
Kingdom	145,110	873	5,559	151,542	3.67
en, Malmédy and St. Vith	1,401	20	40	1,461	2.74

(h) STILL-BIRTH RATE OF ILLEGITIMATE CHILDREN, 1924.

Province	Illegitimate Live Births		Illegitimate Still-births proper	Total Illegitimate Births	Pr of m birt Ille
	Children registered under Births	Children dying before registration			
Antwerp	1,345	13	62	1,420	
Brabant	2,125	26	141	2,292	
Western Flanders	676	12	49	737	
Eastern Flanders	1,004	9	51	1,064	
Hainaut	1,370	4	104	1,478	
Liége	911	4	66	981	
Limburg	281	2	13	296	
Luxemburg	96	1	8	105	
Namur	220	1	25	246	
The Kingdom	8,028	72	519	8,619	
Eupen, Malmédy and St. Vith	16	—	1	17	

6. *Budget.*

(a) General budget for 1925 :

	Fra
Ordinary expenditure	4,246,6
Extraordinary expenditure	621,4
Total	4,868,0

(b) Budget of the Ministry of the Interior and Public Health :

Ordinary expenditure	47,8
Extraordinary expenditure	6,0
Total	53,8

(c) Total of ordinary and extraordinary credits appropriated for expenditure on Public Health by the Ministry of the Interior and Public Health 40,

The details of this expenditure are shown in Chapters X, XI and XIII "Budget of the Ministry of the Interior and Public Health for the Financi 1925 " and in Table I of the "Budget of Extraordinary Receipts and Expe for the Financial Year 1925 ", which are reproduced below.

MINISTRY OF THE INTERIOR AND PUBLIC HEALTH.

ORDINARY EXPENDITURE.

Chapter X.—Health Administration.

Item	Purpose of Expenditure	Am Credi F
28.	Inspectorate of the Health and Public Hygiene Department : Inspection of pharmacies ; Bacteriological Laboratory and State Vaccine Office ; Government Disinfection Department ; staff, salaries and pensions ; allowances, relief	
	Carried forward	

Purpose of Expenditure			Amount of Credit per Item Francs
Brought forward			651,160
I. Inspectorate of the Health and Public Hygiene Department: Inspection of pharmacies; State Bacteriological Laboratory; Government Disinfection Department :			
(a) Travelling expenses and subsistence allowances .. ..fr.	314,500		
(b) Work undertaken in connection with these departments .. ..fr.	45,000		
II. State Vaccine Office :			372,000
(c) Travelling expenses and subsistence allowances .. ..fr.	500		
(d) Work carried out in connection with this office .. ..fr.	12,000		
(a) Inspectorate of the Health and Public Hygiene Department : Inspection of pharmacies ; State Bacteriological Laboratory ; Government Disinfection Department: office expenses and material, taking and analysis of samples, disinfection .. .. fr.	315,000		
(b) State Vaccine Office ; office expenses and material .. .. fr.	80,000		395,000
(a) Central Public Health Board : allowances, attendance fees, travelling expenses and subsistence allowances, printing and miscellaneous expenditure fr.	63,000		
(b) Provincial medical commissions and other commissions under the Health Administration ; allowances, attendance fees, travelling expenses and subsistence allowances, printing and miscellaneous expenses .. .. fr.	237,000		300,000
Health service of seaports and frontiers : staff, salaries, allowances, relief			261,850
(a) Health service of seaports and frontiers : office expenses and materials, printing, clothing allowances and miscellaneous expenditure .. .. ..fr.	158,000		
(b) Travelling expenses and subsistence allowances fr.	16,000		204,000
(c) Work carried out in connection with this service fr.	30,000		
Prophylaxis of infectious diseases ; free issue of serum ; grants ; printing and miscellaneous expenditure			500,000
Carried forward			2,684,010

Item	Purpose of Expenditure		Am Credi F
	Brought forward		2,6
35.	*(a)* Grants to maternity schools : Grants to midwives during and after their studies : (1) to assist them to set up in practice ; (2) to compensate them for professional assistance given free of charge to indigent women .. ..fr.	50,000	
	(b) Grants to schools for male and female nurses ; grants to indigent students to enable them to continue their studies .. ..fr.	60,000	1
	(c) Diffusion of public health knowledge ; lectures and miscellaneous expenses ; publications relating to the medical sciences ; grants, subscriptions ..fr.	30,000	
36.	Costs of participating in exhibitions and congresses organised in the interests of public health ; missions ; propaganda against alcoholism ; grants and miscellaneous expenses ; grants to the Society of Medical Hydrology and Climatology of Belgium ..		
37.	Office international d'hygiène publique : Belgium's share of expenses		
38.	Inspection of food, trade and manufacture : Central Analytical Laboratory ; department for the inspection of butchers' meat ; staff salaries, allowances, relief		4
39.	*(a)* Inspection of food, trade and manufacture : Central Analytical Laboratory ; department for the inspection of butchers' meat : travelling expenses and subsistence allowances .. .. ..fr.	173,000	
	(b) Inspection of food, trade and manufacture : Central Analytical Laboratory ; department for the inspection of butchers' meat : work carried out in connection with this department .. .. ..fr.	28,000	2
40.	*(a)* Inspection of food, trade and manufacture : Central Analytical Laboratory ; department for the inspection of butchers' meat : office expenses and materials, taking and analysis of samples, examination expenses in connection with the certificate of meat inspector .. ..fr.	119,500	
	(b) Costs of participation in exhibitions and congresses .. ..fr.	4,000	1
	(c) Fees of veterinary inspectors .. ..fr.	35,000	
	(d) Printing and miscellaneous expenditure .. ..fr.	20,000	
41.	Inspection of health undertakings, staff, salaries, allowances, relief		
42.	*(a)* Inspection of health undertakings : travelling expenses and subsistence allowances .. .. ..fr.	45,000	
	(b) Inspection of health undertakings : work carried out *re* the inspection .. ..fr.	4,000	
	Carried forward		3,8

Purpose of Expenditure	Amount of Credit per Item Francs
Brought forward	3,837,135
ıspection of health undertakings : office expenses and materials : costs of research and experimenting ; costs of participation in exhibitions and congresses ; printing and miscellaneous expenditure	10,000
rants in aid of improvements in the domain of public health	5,000,000
oyal Academy of Medicine	120,000
ɔst of the use of motor-cars by the provincial departments under the Health Administration	150,000
·ophylaxis against tuberculosis : grants ; miscellaneous expenditure (Provisionally, and owing to existing circumstances, successive advances of 30,000 francs, of which an account must be given subsequently, may be made to directors, administrators or accountants of departments and hospitals under the Health Administration, notwithstanding the provisions of Article 15 of the Organic Law of the Audit Office, dated October 29th, 1846.)	7,000,000
Total for Chapter X	16,117,135

Chapter XI.—Social Hygiene of Children.

easures for the protection of infants :	
) Grants and miscellaneous expenditure ; grants to the National Children's Union for the organisation of lectures on infant hygiene in places where no arrangements are made for medical advice in regard to infants ; *(b)* subsidies for the establishment of maternity homes by the communes or intercommunal associations and the day and night service of maternity homes and crèches	145,000
·penses of participating in exhibitions and congresses organised in the interests of child hygiene ; missions	5,000
ternational Association for the Protection of Children : Belgium's share of expenditure	3,000
·penses consequent on the application of Articles 12 and 13 of the Law of September 5th, 1919, establishing the National Children's Union (supervision of children placed in families or at nurse) ..	5,000
lowances of the Secretary-General of the International Children's Union : attendance fees, travelling expenses and subsistence allowances of members of the Central Child Relief Board and of members of special commissions	15,000
ants to the National Children's Union : medical advice with regard ·o infants ; gifts of milk ; canteens for mothers ; canteens for ailing ·hildren ; settlements for ailing children ; administrative expenses	14,000,000
Total for Chapter XI	14,173,000

EXCEPTIONAL EXPENDITURE.

Chapter XIII.—Miscellaneous Departments.

Item	Purpose of Expenditure[1]
60.	The State's share in the increase of capital for research work of the National Water Supply Association (third instalment) .. .. ..
61.	Sanitary Department and organisation for dealing with the consequences of the war : prophylaxis of venereal diseases ; grants ; miscellaneous expenditure .. .. (Provisionally, and owing to the circumstances, successive advances of 30,000 francs, of which an account must be given subsequently, may be made to directors, administrators or accountants of departments and hospitals under the Health Administration, notwithstanding the provisions of Article 15 of the Organic Law of the Audit Office, dated October 29th, 1846.)
62.	First instalment of the State's share in the cost of the project of the Provincial and Inter-communal Water Supply Association of the Province of Antwerp .. ..
66.	Miscellaneous grants and expenses in connection with studies and research concerning cancer, its prophylaxis and treatment .. ..
	Total expenditure on Public Health under Chapter XIII ..

EXTRAORDINARY EXPENDITURE.

Ministry of the Interior and of Public Health.

4.	Cost of studies and work to be carried out in connection with the mineral springs and sanitary installations of the town of Spa ..
5.	Purchase or construction of premises for the Bacteriological Laboratory of the Health Administration, and initial costs of establishment . .. .
6.	Second instalment of the State's share in the cost of the catchment and exploitation of the head springs of the Neblon, undertaken by the Inter-communal Water Supply Company of the Liège district, and of extensions for supplying the Liège district .. ..
7.	State grant to communes establishing a water-supply to be provided by the " Tusschengemeentelijke Maatschappij der Vlaanderen voor Waterbedeeling " .. ..
8.	First instalment of the State's share in the cost of making further improvements in the water conservancy system of the Maelbeek Valley (first area), carried out by the Province of Brabant .. ..
9.	First instalment of the State's share in the cost of the construction of the large sewers of Saint Job and Stalle at Uccle .. ..
	Total of extraordinary expenditure by the Ministry of the Interior and Public Health .. ..

[1] Items Nos. 63, 64 and 65 relating to expenditure not concerned with public health are omitted from the p

FUNDS DEVOTED TO PUBLIC HEALTH WORKS SUBSIDISED BY THE STATE.

Province	Nature of Funds	Waterworks and Public Wells		Sewers (b)		Ceme
		1923	1924	1923	1924	1923
Antwerp	Communal	»	»	613,574	»	»
	Provincial	»	»	180,281	»	»
	State	»	»	120,890	175,879	15,000
	Total	»	»	**914,745**	. . . . .	**15,000**
Brabant	Communal	976,116	570,681	1,067,320	827,434	109,262
	Provincial	444,432	494,185	235,607	842,127	54,525
	State	338,363	685,747	472,244	601,216	92,832
	Total	**1,758,911**	**1,750,613**	**1,775,171**	**2,270,777**	**256,619**
Western Flanders	Communal	44,000	2,779,895	9,297	545,148	»
	Provincial	40,000	180,261	7,698	68,792	»
	State	25,396	450,000	44,167	85,000	»
	Total	**109,396**	**3,410,156**	**61,162**	**698,940**	»
Eastern Flanders	Communal	»	1,126,323	73,484	68,826	»
	Provincial	»	»	48,875	26,227	»
	State	»	151,866	137,018	105,732	2,937
	Total	»	**1,278,189**	**259,377**	**200,785**	**2,937**
Hainaut	Communal	1,757,946	829,466	401,077	470,075	121,136
	Provincial	778,792	393,584	478,685	161,524	24,520
	State	369,067	987,265	293,818	317,675	15,847
	Total	**2,905,805**	**2,210,315**	**1,173,580**	**949,274**	**161,503**
Liége	Communal	1,180,432	1,656,472	533,185	214,752	206,351
	Provincial	365,647	210,628	170,575	73,965	88,788
	State	206,045	1,343,022	234,359	237,396	116,87
	Total	**1,752,124**	**3,210,122**	**938,119**	**526,113**	**412,01**
Limburg	Communal	»	1,494	»	7,500	13,99
	Provincial	»	1,298	»	6,375	12,09
	State	»	1,494	»	7,500	20,99
	Total	»	**4,286**	»	**21,375**	**47,07**
Luxemburg	Communal	133,720	137,386	»	43,871	37,66
	Provincial	17,495	21,609	»	5,519	6,27
	State	148,086	141,064	19,073	11,810	24,59
	Total	**299,301**	**300,059**	**19,073**	**61,200**	**68,53**
Namur	Communal	112,769	896,772	33,624	52,229	117,96
	Provincial	35,446	14,050	7,765	»	33,65
	State	28,536	306,179	95,063	35,623	116,48
	Total	**176,751**	**1,217,001**	**136,452**	**87,852**	**268,10**
The Kingdom	Communal	4,204,983	»	2,731,561	»	606,37
	Provincial	1,681,812	»	1,129,486	»	219,85
	State	1,115,493	4,066,637	1,416,632	1,577,831	405,55
	Total	**7,002,288**	. . . . .	**5,277,679**	. . . . .	**1,231,77**

LIST OF STATE

YEAR	Waterworks and Public Wells	Sewers	Cemeteries	Slau ho
	Fr.	Fr.	Fr.	
1913	795,303	626,699	125,876	1
1919	161,329	647,213	37,516	
1920	597,712	1,904,986	183,582	
1921	1,267,142	2,411,280	552,835	7
1922	977,591	2,675,906	211,107	
1923	1,115,493	1,416,632	405,554	
1924	4,066,637	1,577,831	405,666	

Note.— No details are available of the grants made out of communal and provincial funds in the province of

[1] According to information furnished by the Ministry of Health and Public Hygiene. (Ministry of the H Health.)

(a) The table shows expenditure actually effected on work carried out in the course of the year or during t The communes, the provinces and the State generally pay their share towards the cost of public health w instalments as the work proceeds. The sums shown in the table as communal, provincial or State expenditure necessarily refer to the same undertakings.

	Liquid Manure Tanks and Cesspools		Disinfecting Stations, Quarantine Hospitals and Wards for Infectious Cases		Shower Baths		Miscellaneous: Incinerators, filling-up of ditches, etc.		Total	
	1923	1924	1923	1924	1923	1924	1923	1924	1923	1924
	»	»	»	»	»	»	»	»	613,574	420,189
	»	»	»	»	»	»	»	»	180,281	756,606
	»	»	»	»	»	»	»	»	135,890	205,290
	»	»	»	»	»	»	»	»	**929,745**	**1,382,085**
	»	»	»	»	»	»	68,400	»	2,221,098	1,486,817
	»	»	»	»	»	»	2,800	»	737,364	1,393,312
	»	»	»	»	»	»	30,000	»	933,439	1,363,307
	»	»	»	»	»	»	**101,200**	»	**3,891,901**	**4,243,436**
	»	»	»	»	»	»	»	»	53,297	3,325,043
	»	»	»	»	»	»	»	»	47,698	249,053
	»	»	25,000	»	»	»	»	»	94,563	535,000
	»	»	**25,000**	»	»	»	»	»	**195,558**	**4,109,096**
	»	»	»	»	»	»	»	»	73,484	1,224,945
	»	»	»	»	»	»	»	»	48,875	46,638
	»	»	»	»	»	»	»	»	139,955	270,598
	»	»	»	»	»	»	»	»	**262,314**	**1,542,181**
	»	»	»	»	»	»	»	»	2,280,159	1,806,767
	»	»	»	»	»	»	»	»	1,281,997	602,392
	»	»	»	»	»	»	»	»	678,732	1,359,021
	»	»	»	»	»	»	»	»	**4,240,888**	**3,768,180**
	»	»	510	»	»	»	3,789	6,715	1,924,267	2,276,843
	175	»	»	»	»	»	»	»	625,185	353,116
	500	700	3,500	»	»	»	»	»	561,275	1,710,615
	675	**700**	**4,010**	»	»	»	**3,789**	**6,715**	**3,110,727**	**4,340,574**
	»	»	»	»	»	»	298	1,289	14,290	31,472
	»	»	»	»	»	»	298	850	12,391	26,896
	68	200	»	»	»	»	298	»	21,357	28,378
	68	**200**	»	»	»	»	**894**	**2,139**	**48,038**	**86,746**
	»	»	»	»	»	»	»	»	171,384	284,180
	1,950	986	»	»	»	»	»	»	25,719	47,038
	324	»	»	»	»	»	2,631	»	194,706	192,612
	2,274	**986**	»	»	»	»	**2,631**	»	**391,809**	**523,830**
	»	»	»	»	»	»	»	»	264,360	1,109,806
	»	»	»	»	»	»	»	»	76,863	39,972
	»	»	»	50,000	»	»	»	1,360	240,083	437,573
	»	»	»	**50,000**	»	»	»	**1,360**	**581,306**	**1,587,351**
	»	»	510	»	»	»	72,487	»	7,615,913	11,966,062
	2,125	»	»	»	»	»	3,098	»	3,036,373	3,515,023
	892	900	28,500	50,000	»	»	32,929	1,360	3,000,000	6,102,394
	3,017	. . .	**29,910**	. . . .	»	»	**108,514**	. . .	**13,652,286**	**21,583,479**

IC HEALTH WORK.

re Tanks spools	Disinfecting Stations, Quarantine Hospitals and Wards for Infectious Cases	Shower Baths	Miscellaneous: Wash-houses, Meat Sterilising Apparatus, Drinking-troughs, Incinerators, filling-up of ditches	Total
	Fr.	Fr.	Fr.	Fr.
4	24,516	»	5,610	1,644,648
9	7,800	»	893	877,540
0	9,393	»	324,557	3,022,460
5	194,804	15,000	95,104	4,550,000
0	126,676	»	38,171	4,000,000
2	28,500	»	32,929	3,000,000
0	50,000	»	1,360	6,102,394

inistry for Agriculture and Public Works also grants subsidies for the construction of sewers established under the ystem. The amount of these subsidies is not included in this table.
inistry of Justice also grants subsidies for the establishment of quarantine hospitals and wards for infectious cases. ıese subsidies is not included in this table.

II. RECENT REFORMS IN HEALTH LEGISLATION.

Organic Law on Public Assistance, March 10th 1925.

This law aims at prevention rather than assistance proper.

The Central Public Health Board has prepared and issued regulations fo construction of quarantine hospitals and sanatoria; these regulations are accomp by plans.

Belgium has signed the Second International Opium Convention of Feb 1925, supplementing the Hague International Opium Convention of 1912.

III. GENERAL QUESTIONS.

Health Propaganda.

Desirous of improving the social well-being of the population, the Belgian Go ment is making efforts to spread general ideas of hygiene by means of pamphlet lectures.

The pamphlets explain briefly the means of combating the principal infectiou social diseases.

In their lectures to medical and university circles, to research workers, to n etc., the Health Inspectors deal with individual hygiene, general hygiene commu ble diseases in general, and particularly with children's health, school hygiene, hygiene, etc.

The programme of special lectures for elementary teachers includes hygi connection with food, housing, breathing, and other personal hygiene.

Finally, in order to reach the masses of the people, the Health Administrati established relations with a few large social organisations like the League of Ch Women, the Women Farmers' Association and the co-operative societies, propaganda agents, acting under the direction of the Government Health Inspe explain to their members questions of health according to the social position o audiences.

During the second half of 1925, the League of Christian Women gave 26 le on infectious diseases, the health of pregnant women, health of adolescents and girls.

During the same period, the Women Farmers' Associations gave 264 lectu tuberculosis, infectious diseases, treatment of the sick and milk hygiene.

BULGARIA

BY

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III. Preventive Medicine and Hygiene.

1. Campaign against Social Diseases :

   (a) Tuberculosis. . . . . .
   (b) Syphilis . . . . . .
   (c) Malaria . . . . . .
   (d) Trachoma. . . . . .
   (e) Narcotic Drugs . . . . . .

2. Protection of Maternity and Children :

   (a) Protection of Maternity . . . . . .
   (b) Protection of Children . . . . . .
   (c) School Hygiene . . . . . .
   (d) Protection of Adolescence . . . . . .

3. Protection of Other Groups :

   (a) Protection of Workers . . . . . .
   (b) Protection of Refugees . . . . . .

4. Applied Hygiene :

   (a) Water Supply . . . . . .
   (b) Removal of Refuse . . . . . .
   (c) Drainage of Marshy Districts . . . . . .
   (d) Public Buildings . . . . . .
   (e) Housing Problem. . . . . .
   (f) Inspection of Foodstuffs . . . . . .
   (g) Campaign against the High Cost of Living . . . . . .
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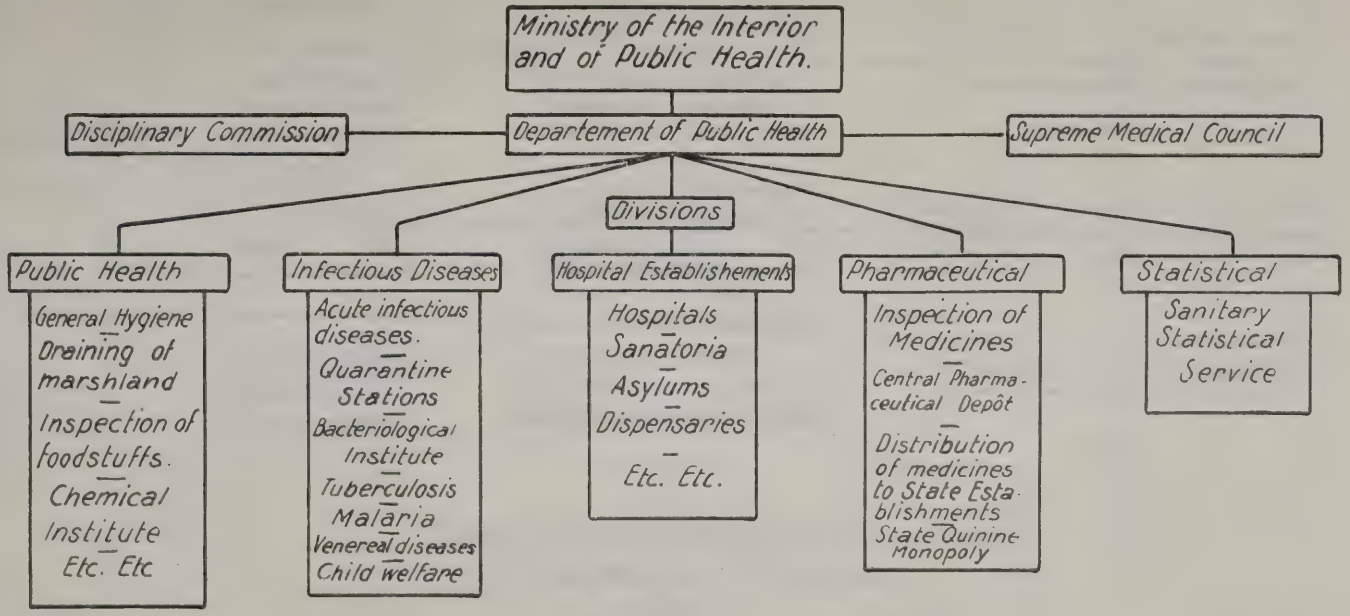
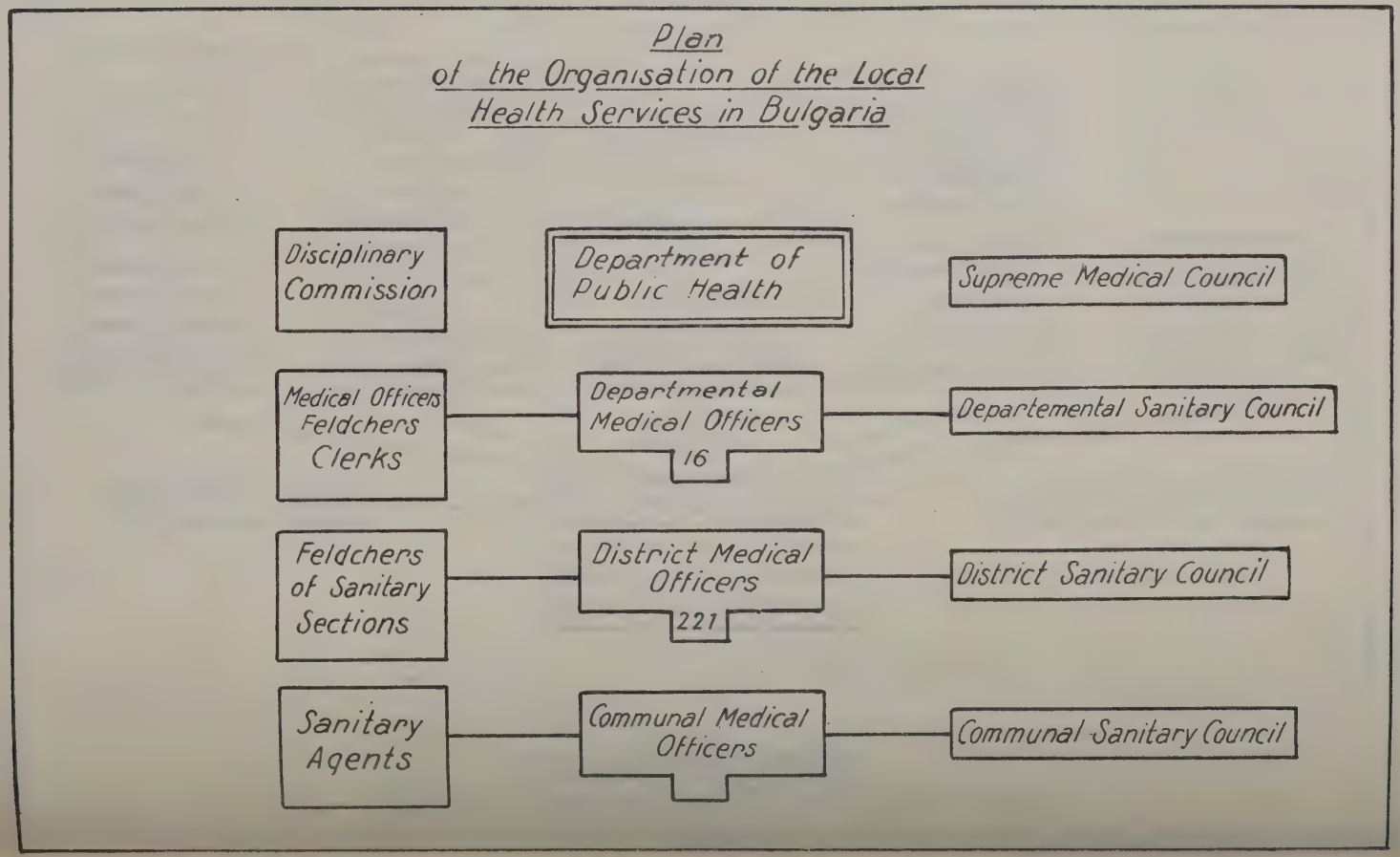
IV. Curative Medicine and Health Personnel.

1. Hospitals . . . . . .
2. Pharmacies . . . . . .
3. Health Personnel . . . . . .

Plan of the Organisation of the Public Health Services in Bulgaria




Plan
of the Organisation of the Local
Health Services in Bulgaria
Disciplinary Commission
Department of Public Health
Supreme Medical Council
Medical Officers
Feldchers
Clerks
Departmental Medical Officers
16
Departemental Sanitary Council
Feldchers of Sanitary Sections
District Medical Officers
221
District Sanitary Council
Sanitary Agents
Communal Medical Officers
Communal Sanitary Council

I. GENERAL INTRODUCTION.

1.

ıe area of Bulgaria is 103,146 square kilometers.

ulation.

, the date of the last census (December 31st, 1920) the population of Bulgaria red 4,861,432.

ıking into account the excess of births over deaths in the years 1921-25, pulation at the end of 1925 should amount to about 5,301,420.

h Rate.

Year	Total number of births	Birth rate
1921	176,350	36.3
1922	197,297	40.0
1923	183,118	36.4
1924	199,170	38.9
1925	191,080	36.7

ıeral Mortality.

GENERAL DEATH RATE, 1921-25.

Year	Total number of deaths	Death rate
1921	97,927	19.8
1922	101,358	20.1
1923	103,807	20.3
1924	103,573	19.9
1925	100,369	19.3

fant Mortality.

DEATHS OF CHILDREN UNDER ONE YEAR OF AGE.

Year	Number of deaths	Rate per 1,000 (new-born) infants	Rate per 1,000 deaths	Per 1,000 inhabitants
1921 ..	23,745	134.6	242.5	4.81
1922 ..	29,125	147.6	287.3	5.78
1923 ..	29,850	164.0	287.6	5.84
1924 ..	29,859	419.9	288.3	5.73
1925 ..	28,840	150.9	287.3	5.44

rbidity and Mortality due to Acute Infectious Diseases, 1921-25.

Year	Morbidity		Mortality	
	Total number	Per 10,000 inhabitants	Total number	Per 10,000 inhabitants
1921 ..	50,864	102.96	4,202	8.50
1922 ..	24,778	49.20	2,474	4.91
1923 ..	35,703	69.79	4,321	8.44
1924 ..	32,861	63.06	3,288	6.31
1925 ..	49,521	93.42	2,584	4.87

7. *Budget of the Central Public Health Department.*

The State Budget for the financial year 1925-26 amounted to 6,875 millio of which 176,233,080, or 3.8 per cent, represents the budget of the Central Health Department. The proportion was :

2.71	per cent in	1924-25
3.30	,,	1923-24
3.2	,,	1922-23
5.25	,,	1919-20

The Government having decreed in 1925 that no expenditure should be in without the special authorisation of the Ministry of Finance, certain credit sha been partially spent, and the actual expenditure on public health is not yet k

II. MEASURES TAKEN TO IMPROVE THE PUBLIC HEALTH OF COUNTRY.

1. *Health Legislation.*

The following laws and regulations came into force in 1925 :

A. Regulations drawn up by the Ministry of the Interior and of Public Hea

1. Regulations on the taking of specimens for bacteriological examinatio their despatch.
2. Regulations on the health service in malaria zones.
3. Law on the pensions awarded to staff having suffered during the ca against plague, cholera and typhus.
4. Regulations with regard to the administration and utilisation of the fun lished for making loans to the communes for water supply, drainage, electric l and public health works.

B. Laws and Regulations drawn up by other Ministries :

1. Law on the construction of the Rila-Sofia aqueduct (Ministry of Fi
2. Law on the relief of persons suffering from the effects of the war (M of War).
3. Law on the provision of work for the unemployed and on unempl insurance (Ministry of Industry and Labour).
4. Law on the creation and upkeep of rest stations for the personnel of th telegraph and telephone services (Ministry of Railways and Posts).

C. Laws and Regulations drawn up in 1925 and submitted to the Central Medical Board :

1. Law on the inspection of foodstuffs.
2. Regulations concerning health resorts for tubercular patients.
3. Regulations of the nursing school of the Belgian Red Cross Society.
4. Regulations with regard to courses for visiting nurses.

nisation of Health Services.

lgaria is divided into 16 health departments, each under departmental doctors, ›divided into 221 health districts under district doctors. Each health district ed into health sections (of which there are 1,007) under feldschers. Of the 221 doctors, 125 are paid by the State, and 96 by the Departmental Councils ; 1,007 feldschers, 450 are paid by the State and 537 by the Departmental s

venty-four communes possess communal health services.
e number of communal doctors is 114, including eight school doctors and four doctors.

paign against Infectious Diseases in 1925.

A. *Health Measures on the Fronliers.*

e Burgas area is bounded by the Turkish frontier and the department of Varna. esses a quarantine service in the port of Burgas, under a quarantine doctor ; rantine service at the small ports is entrusted to the local doctors and feldschers. e Varna area is bounded by the Roumanian frontier and the department gas ; it is also under a quarantine doctor. The health service of the Varna ssesses a quarantine hospital. Varna admits all vessels (infected, suspected th clean bills of health), while Burgas only admits vessels with clean bills of

disinfection and disinsectisation station is at present under construction in t of Burgas for travellers and their effects.

ORK OF THE QUARANTINE SERVICES OF BURGAS AND VARNA IN 1925.

	Burgas	Varna
Number of vessels admitted to free pratique ..	1,074	784
Number of visas granted..	660	315
Number of vessels coming from districts declared to be infected..	160	113
Number of vessels disinfected	58	1
Number of vessels deratted	102	28
Number of travellers coming from infected areas..	291	1,225

ıe quarantine station of Rustchuk remained closed during 1925 ; it is only hen a riparian country of the Danube (including Russia) is declared infected. › vessels from Russia arrived in Bulgaria by way of the Danube in 1925.
ıe quarantine station of Svilengrad examined 17,272 travellers, of whom were refugees from Western Thrace and Greek Macedonia.
addition to the inspection station of Marikosteno, an inspection station is organised at Liubahova, near Nevrokop, and a provisional station at Makaza, Gumuljina-Haskovo road.
448 refugees passed through these stations and were sent into the interior medical examination, disinsectisation, disinfection and vaccination against ox, and after being kept under observation for at least seven days.

B. *Measures against Epidemics.*[1]

(a) *Notification of Infectious Diseases.*—No addition has been made to t of infectious diseases requiring compulsory notification.

Royal Decree No. 2, dated December 17th, 1925, orders that infectious d must be notified within twenty-four hours following discovery of the case.

By decision of the Council of Ministers, dated August 21st, 1925, notifica pestilential diseases must be made by telegram, and that of other infectious d by post. No postal charge is made in either case.

With a view to combating anthrax, glanders and trichinosis, the Central Health Department and the Veterinary Service of the Ministry of Agricultur decided that any medical officer discovering a case of these diseases must the veterinary surgeon of the district in order to enable him to ascertain the of infection and to take the necessary measures ; veterinary surgeons are also to notify the district medical officers concerned of all cases of these diseases ob among animals.

(b) *Detection of Infectious Diseases.*—Special funds have been voted to doctors who have distinguished themselves in the campaign against infectious di

Any doctor who discovers an infectious disease must draw up a statement particulars of the number of cases, the source of infection and the precaut measures taken. As these statements are often incomplete, the General Public Department is preparing a form which will shortly be introduced.

(c) *Tracing of Cases of Infectious Diseases.*—In every locality, health comm have been set up to detect persons suffering from infectious diseases. In lo in which cases of pestilential diseases have occurred, this is entrusted to th epidemic detachment.

(d) *Diagnosis of Infectious Diseases.*—In 1925, the Departmental Councils of Plevna, and Stara Zagora established bacteriological laboratories in these The number of bacteriological examinations carried out by the State Bacteric Institute at Sofia in the last three years has been as follows :

	1923	1924	1925
Vidal	824	1,185	791
Wassermann	725	995	2,230
Weinberg	99	78	105
Tests for Koch bacillus	502	570	406
Tests for parasites of malaria	453	425	233
Other analyses	524	500	475
Total	3,127	3,753	4,240

The number of bacteriological examinations made by the Health Instit 1925 was :

Examinations for diagnosis of typhoid fever	731
Wassermann tests	404
Tests for Koch bacillus	7
Tests for Löfler bacillus	4
Other analyses	17

[1] A table showing the number of cases of infectious diseases and the number of deaths caused by these in Bulgaria in 1925 is to be found in *Epidemiological Intelligence*, No. 10, page 122.

e number of bacteriological examinations made at these two institutes showed ease in 1925, notwithstanding the opening of a number of laboratories in the of the country.

1925, the " Regulations on the taking of specimens for bacteriological and cal examinations " came into force.

e Central Public Health Department has prepared the " Regulations of the ental and communal health institutes ".

h a view to constructing a central health institute at Sofia and provincial health es, the Central Public Health Department has drawn up a " Law on the creation und for the construction and upkeep of health institutes in Bulgaria ".

Isolation of Patients suffering from Infectious Diseases.

ER OF PATIENTS SUFFERING FROM INFECTIOUS DISEASES ISOLATED IN THE HOSPITALS IN 1925.

Disease	Number of cases notified in Bulgaria	Number of patients treated in the hospitals	Percentage of cases treated in the hospitals in 1925	Percentage of cases treated in the hospitals in 1924
.. .. ..	217	104	47.92	61.93
.. .. ..	3,444	2,060	59.81	40.88
ry	251	119	47.41	65.30
ria	1,557	535	34.36	38.73
fever	3,447	1,746	50.65	36.66
.. .. ..	31,307	480	1.53	1.72
ng-cough.. ..	7,717	95	1.23	1.12
pox	615	27	4.38	5.63

will be seen that the number of patients suffering from acute infectious diseases in the hospitals in 1925 increased ; this applies particularly to typhoid fever arlet fever.

e Central Public Health Department has not yet been able to build isolation or infectious cases ; the accommodation of such patients still leaves much to be and this is one of the reasons why so few parents have recourse to hospital nt when their children are suffering from infectious diseases.

e Central Medical Board has decided that a locality would be regarded as free fectious disease when a number of days equal to the duration of the period ation of the disease has elapsed after the disappearance of the last case by cure ase and after regular disinfection.

Immunisation.

R OF SERUM PHIALS PREPARED BY THE STATE BACTERIOLOGICAL INSTITUTE AT SOFIA FROM 1922 TO 1925.

against	1925	1924	1923	1922
eria	21,021	17,316	20,529	14,714
s	13,895	10,727	10,181	8,034
ery	2,376	1,942	2,020	2,153
coccus	2,684	2,552	2,501	2,273
ococcus	591	438	434	609
	40,567	32,972	35,665	27,783

In 1925, this Institute also prepared :

488 litres of anti-typhoid vaccine ;
2,845 litres of anti-streptococcus vaccine ;
2,315 litres of gono-vaccine ;
20,400 litres of " typhus murium " preparation ;
22,150 doses of smallpox vaccine.

In 1925, the anti-plague laboratory of the Health Institute continued to cu
the anti-plague virus and to render immune the horses used for the productio
anti-plague serum and of the reserves of anti-plague vaccine. The minimu
of fixed virus obtained at the Health Institute kills a guinea-pig weighing 300 g
in from 48 to 60 hours. 9,000 cubic centimeters of anti-plague vaccine were p
in 1925, but there was no occasion to use it.

In localities in which typhoid fever has assumed an epidemic character,
which it was due to the water, 135,571 anti-typhoid vaccinations were effected i
In 1925, the vaccinations were continued in localities in which the water was su
and in those in which cases of typhoid fever had occurred in the previous years
number of persons vaccinated against typhoid fever in 1925 was approximat
same as in 1924.

(g) *Disinfection.*—The disinfection services have made progress during th
1925. The Central Public Health Service has at its disposal 199 disinfection ap
(202 in 1924), 22 of which are fixed (24 in 1924), and 177 portable (178 in
22 stationary apparatus and 143 portable apparatus, or 80 per cent
total, are in good condition. Two disinfection stations have been constructe
port of Burgas and at the State Hospital of Plevna. A second disinfection
was organised in which 63 persons took part, bringing up to 123 the number of
who have followed these courses. In addition, an instructor examines on th
the disinfection officials and gives them final instructions. The adop
hydrocyanic acid for the destruction of rats and insects is under considerati

(h) *Certification of Deaths.*—The Central Public Health Service has decide
in all localities possessing a doctor deaths should be certified by him and no
by the feldscher.

(i) *Anti-epidemic Delachments.*—In 1925, nine anti-epidemic detachment
sisting of a doctor, a disinfection official and an orderly, carried out their d
60 villages ; they visited 11,033 dwellings and disinfected 2,795, together w
personal effects of 14,925 patients ; they also disinsectised 9,321 persons ;
26 localities they combated typhus ; in 22, typhoid fever ; in 9, scarlet fever; a
various infectious diseases ; they carried out a number of anti-typhoid vacci
deratised the ports of Burgas and Varna, etc.

C. *Campaign against certain Infectious Diseases.*

(a) and (b). No cases of *plague* or *cholera* occurred in 1925.

(c) No case of *smallpox* in 1925. The morbidity, mortality and case
of this disease from 1921 to 1924 are shown in the following table :

	Morbidity		Mortality		Case fatality
	Number of Cases	Rate per 10,000 inhabitants	Number of Deaths	Rate per 10,000 inhabitants	Rate per 100
.. ..	22	0.045	5	0.01	22.72
.. ..	24	0.048	3	0.066	12.50
.. ..	20	0.04	6	0.01	30.0
.. ..	5	0.01	—	—	—

anks to the measures taken at the frontiers, no cases of smallpox occurred among gees. The number of persons vaccinated and revaccinated during the last rs (excluding vaccinations carried out in quarantine stations, frontier-inspection and in the army) is shown in the following table :

Vaccinations			Revaccinations		
Persons vaccinated	Positive results Number	%	Persons revaccinated	Positive results Number	%
101,578	93,962	92.5	60,897	35,748	45.0
128,649	113,119	86.9	89,035	54,577	61.0
155,451	51,622	93.9	42,951	24,475	56.0
179,213	161,728	90.2	85,286	52,115	59.9
204,805	189,130	92.3	180,493	125,001	69.0

Typhus, which made its appearance in Bulgaria in 1914 and which was on line, showed a slight recrudescence in 1925, as will be seen in the following table :

	Morbidity		Mortality		Case fatality
	Number of Cases	Rate per 10,000 inhabitants	Number of deaths	Rate per 10,000 inhabitants	Rate per 100
.. ..	874	1.79	99	0.21	11.52
.. ..	488	0.98	68	0.14	14.68
.. ..	413	0.83	51	0.10	12.83
.. ..	197	0.29	28	0.05	14.20
.. ..	217	0.44	15	0.03	6.9

1925, there were three principal foci of typhus: the village of Parile, in the nent of Petritch, near the Greek frontier, with 27 cases (at first mistaken for za) and later 12 cases ; the department of Kustendil, with 73 cases, 24 of which the village of Kraïntzi and 10 in a neighbouring village (the infection was t by wandering gipsies) ; the village of Gradishte (department of Tirnovo), 5 cases. Typhus fever only occurred in 1925 in four departments.

No case of *relapsing fever* in 1925.

Cerebro-spinal meningitis, as will be seen from the following table, was rare red with the other notifiable infectious diseases.

Morbidity		Mortality		Case fatality
Number of Cases	Rate per 10,000 inhabitants	Number of Deaths	Rate per 10,000 inhabitants	Rate per 100
.. 36	0.07	22	0.04	61.11
.. 6	0.01	3	0.006	50.00
.. 12	0.02	6	0.01	50.00
.. 13	0.02	9	0.01	69.23
.. 16	0.03	6	0.03	37.5

(g) *Typhoid fever* appeared in epidemic form in 1913, 1917 and 1924. V
below the figures of morbidity, mortality and case fatality of this disease fro
to 1925.

Year	Morbidity		Mortality		Case fa
	Number of Cases	Rate per 10,000 inhabitants	Number of Deaths	Rate per 10,000 inhabitants	R per
1921 ..	1,915	3.93	222	0.45	11.
1922 ..	2,867	5.57	301	0.60	10.
1923 ..	2,799	5.63	326	0.65	11.
1924 ..	7,124	14.22	816	1.62	11.
1925 ..	3,444	7.08	465	0.95	13.

Thanks to the measures taken, the recrudescence observed in 1924 ma
diminished in 1925, although the morbidity did not fall as low as the figures
previous years. The case fatality of typhoid fever was higher in 1925 than
the five previous years ; as in 1924, it was specially high in the departments of
(19 per cent) and Sumen (19.4 per cent).

One of the causes of this high case fatality is the lower intellectual stan
these two departments ; the population of the first-named consists largely of re
and that of the second includes a large proportion of Turks who endeavour to
their cases of infectious diseases. The department of Burgas, moreover, p
very few hospitals for infectious diseases.

The Central Public Health Department has drawn the attention of doc
the importance of milk as a medium of propagation of certain infectious d
particularly typhoid fever. Germ-carriers must be kept under observatio
repeated bacteriological examinations have given negative results.

(h) The number of cases of *dysentery* declared in 1925 (251 cases, 0.516
thousand) was lower than in 1924 (388 cases, 0.776 per ten thousand).

(i) There was a recrudescence of *diphtheria* in 1925, as is shown by the fo
figures :

Year	Morbidity		Mortality		Case fa
	Number of Cases	Rate per 10,000 inhabitants	Number of Cases	Rate per 10,000 inhabitants	pe
1921 ..	1,054	2.16	151	0.31	14
1922 ..	795	1.60	108	0.22	13
1923 ..	1,094	2.20	167	0.34	14
1924 ..	1,505	3.004	228	0.455	14
1925 ..	1,557	3.203	184	0.378	11

The Central Public Health Department has instituted an enquiry into the
of this high case fatality.

(j) *Scarlet fever*, which is very prevalent in Bulgaria, claims many victims
children ; it is known as the " children's plague ". In 1925, its morbidity, m
and case fatality were lower than in previous years.

	Morbidity		Mortality		Case fatality
	Number of Cases	Rate per 10,000 inhabitants	Number of Cases	Rate per 10,000 inhabitants	Rate per 100
..	1,837	4.59	277	0.62	12
..	2,171	5.24	415	1.01	19
..	6,355	15.41	1,160	2.82	18
..	5,474	13.08	1,055	2.53	19
..	5,095	12.02	1,060	2.50	20
..	4,799	11.14	931	2.16	19
..	2,130	4.88	362	0.83	16
..	1,624	3.66	256	0.58	15
..	2,720	6.05	493	1.09	18
..	6,923	14.26	1,235	2.55	17
..	3,440	6.98	577	1.17	16
..	4,092	8.18	699	1.40	17
..	5,131	10.21	903	1.80	17
..	2,435	4.79	519	1.02	21
..	3,113	6.23	552	1.10	19
..	4,398	9.11	760	1.58	18
..	6,062	12.45	1,184	2.43	19
..	7,196	14.49	1,206	2.49	17
..	15,585	31.40	2,842	5.74	18
..	7,466	14.90	1,360	2.71	18
..	3,447	7.09	468	0.96	13

arlet fever in 1925 had therefore reverted to its normal figures. The low case observed in this year is due to the fact that the disease was very mild[1]. The medy—the isolation of patients in hospitals—continued to be applied in 1925.

Measles is a sporadic disease, which occasionally assumes the form of an ic in Bulgaria. The morbidity, mortality and case fatality of measles in the e years are given below :

	Morbidity		Mortality		Case fatality
	Number of Cases	Rate per 10,000 inhabitants	Number of Deaths	Rate per 10,000 inhabitants.	Rate per 100
..	25,710	52.77	1,896	3.90	7.37
..	8,700	17.61	443	0.90	4.98
..	10,264	20.68	504	1.02	4.90
..	7,393	14.75	293	0.48	3.96
..	31,307	64.34	854	1.76	2.7

will be seen that epidemics of measles recur in Bulgaria every four years. ifficult to combat this disease, because it is transmitted even before the first oms appear.

In 1925, *whooping-cough* was more prevalent than during the previous years ; tality and case fatality were also high.

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[1] The Frequency of Scarlet Fever and the Present Position of the Campaign against this Disease in Bulgaria", esent author, in the *Bulletin mensuel de l'Office international d'hygiène publique*, Vol. XVII, No. 12, Paris,

Year	Morbidity		Mortality		Case f
	Number of Cases	Rate per 10,000 inhabitants	Number of Deaths	Rate per 10,000 inhabitants	R per
1921 ..	4,979	10.27	340	0.70	6
1922 ..	2,277	4.52	199	0.40	8
1923 ..	3,636	7.33	212	0.43	5
1924 ..	7,765	15.50	459	0.91	5
1925 ..	7,717	15.87	523	1.07	6

(m) *Rabies.*—In 1925, 3,592 persons bitten by animals suffering fro (89 more than in 1924) were treated by the Anti-Rabies Section of the State logical Institute at Sofia. This figure included 1,200 men, 934 women and 1, dren. The Högyes-Alivisatos method continued to be employed, and 1,36 were inoculated and their brains used to prepare the vaccine. Only three fa occurred : the first 30 days, the second 36 days and the third 201 days after of treatment. Since the introduction of the Högyes-Alivisatos method, the c lity of hydrophobia has fallen from 0.22 per cent in 1924 to 0.08 per cent The Central Public Health Department issued certain instructions to the he sonnel in 1925 regarding the nature of hydrophobia and the treatment of perso

III. PREVENTIVE MEDICINE AND HYGIENE.

1. *Campaign against Social Diseases.*

(a) *Tuberculosis.*—According to the enquiry undertaken by the Centra Health Department with regard to tuberculosis mortality between 1900 a in 50 of the 54 towns of over 5,000 inhabitants in Bulgaria, this mortality, w 3.5 per 1,000 inhabitants in 1905, fell to 2.4 per 1,000 in 1913 ; after the Bal it reached the figure of 2.8 per 1,000 ; during and after the Great War, th were : 1916 and 1917, 2.9 ; 1918, 3 ; 1919, 3.4 ; 1922, 3. The highest r was observed in the departments of Vidin (4.24), Burgas (3.57), Plevna (3

Tuberculosis is very prevalent among soldiers and the men of the co labour service. In 1923, for example, the hospitals treated 211 tuberculous (7.17 per thousand of the average annual contingent). In 1922, out of th young men examined with a view to recruiting for the compulsory labou 108 (15 per thousand) were found to be tuberculous.

The Central Public Health Department has undertaken an enquiry into th of the high incidence of tuberculosis in Bulgaria. For this purpose it has d a questionnaire for the use of the doctors of the sanatoria, hospitals and sta tuberculosis. Bulgaria possesses no special legislation in connection with the c against tuberculosis ; but a Bill, drawn up in 1924, will be incorporated in the law on public health. Before the Great War, Bulgaria had 150 beds specially for tuberculosis cases ; at present she possesses two sanatoria with 240 bed tuberculosis wards with 310 beds in the first- and second-class hospitals, an tuberculosis stations with 110 beds, making a total of 660 beds.

In 1922, 5,922 tuberculosis cases were treated in the sanatoria and ho in 1924, the total amounted to 7,353.

Cases of surgical tuberculosis are treated in the Varna Marine Sanato Children, which, for the last two years, has been open all the year. In 19 tuberculosis cases were treated there. Cases of surgical tuberculosis are also

surgical wards of the first-class hospitals and some of the second-class hospitals
4, these wards treated 2,239 cases of surgical tuberculosis.
1924, the clinic for venereal and skin diseases, directed by Professor Béron,
d a photo-therapeutic institute with a Finsen apparatus. 578 cases, including
upus, were treated there in 1925.

OF CASES OF TUBERCULOSIS TREATED IN THE DIFFERENT HOSPITALS OF BULGARIA IN 1924, CLASSIFIED ACCORDING TO SEAT OF THE DISEASE AND SEX.

Hospital	Pulmon. tuber.	Osseous tuber.	Articular tuber.	Gang. tuber.	Abdom. tuber.	Tuber. of perito-neum.	Tuber. of other organs	Total	Men	Women
z Sanatorium ..	725	—	—	—	—	—	—	725	450	275
ı Sanatorium ..	311	—	—	—	—	—	—	311	203	108
Sanatorium ..	—	65	37	466	—	15	—	603	304	299
tals with tubercu-; wards	2,189	193	99	51	45	209	85	2,871	1,659	1,212
ns for tuberculous ents	65	9	—	—	—	4	10	88	46	42
hospitals of Cl. I	1,902	234	174	35	51	177	71	1,944	1,238	706
tals of Cl. II ..	422	22	46	7	15	30	35	577	326	251
tals of Cl. III ..	200	6	6	3	2	6	11	234	134	100
otal	5,814	529	362	562	113	441	212	7,353	4,360	2,993

he Ministry of Education has begun the construction of a sanatorium near ne, in the Rhodope mountains, for members of the teaching profession. The tment of Posts, Telegraphs and Telephones has created a fund for the construc- nd upkeep of a sanatorium for its employees. The site of this sanatorium has y been chosen, and its erection will be begun in 1926. The Ministry of Industry abour has studied the construction of a sanatorium for tuberculous workmen ıre members of the "Social Insurance Fund". The Central Public Health tment is considering the creation of a health resort for tuberculous cases at ol, in the Rhodope mountains, where the State, the Departments, certain rations, and private persons will be able to establish sanatoria.

The dispensary of the Society for the Campaign against Tuberculosis at Sofia ned 2,413 patients, of which 1,586 were old cases. 452 of the 827 new patients found to be tuberculous. 1,900 patients were treated for tuberculosis ; 42 were ted to sanatoria and 32 sent to the tuberculosis ward of the Alexander Hospital fia. In addition, 163 patients received assistance in kind, and 10 children of culous parents were sent to the educational colony of the above society. The nsary's budget for 1925 amounted to 284,830 leva, as against 198,548 in 1924.

b) *Syphilis.*—Syphilis has been endemic in Bulgaria for the last century. It nown that in certain villages the majority of the population was infected with lisease. Professor Béron estimates that during the Great War 14 per cent of Bulgarian soldiers suffered from syphilis.

,306 out-cases were examined and treated in the dispensaries in 1924 ; of this ber, 119 were cases of primary syphilis, 384 of secondary syphilis, 334 of tertiary

syphilis, 413 of congenital syphilis and 56 of syphilis in an indeterminate stag number of bed patients treated in the various hospital departments in 1924 follows :

Hospital Establishments	Syphilis : Number of Cases				
	Primary	Secondary	Tertiary	Congenital	Latent
Hospitals of Class I with venereal ward ..	206	539	161	23	106
Hospitals of Class I without venereal ward ..	9	81	20	4	—
Hospitals of Class II ..	9	80	4	1	—
Hospitals of Class III ..	—	49	—	—	—
Total	224	749	185	28	106

The anti-syphilis detachment created in 1922 for the campaign against s in the country districts worked in four villages in the department of Vrat examined 3,031 persons and discovered 849 cases of syphilis (28 per cent). In two anti-syphilis detachments worked in the departments of Vratza and Vidin. examined 6,728 persons and discovered 1,797 cases (26 per cent). In 1924 anti-syphilis detachments examined in the same departments 52,566 persons a covered 7,093 cases of syphilis (13.9 per cent). In 1925, the number of detach was increased to four ; they operated in the departments of Vidin, Vratza, and Burgas and examined 65,674 persons, 7,013 of whom were found to be su from syphilis (10 per cent). The incidence of syphilis in the localities in whi detachments worked in 1925 is shown in the following table :

	Depart. of Vidin	Depart. of Vratza	Depart. of Plevna	Depart. of Burgas
Number of localities.	28	13	6	8
Number of families .	5,999	2,002	2,158	1,473
Number of families infected	1,410	613	92	188
Percentage of families infected.	23.53	30.63	4.21	12.75
Total population ..	36,634	14,681	10,547	5,704
Number of persons examined	36,499	14,629	9,452	5,094
Number of persons infected	5,565	1,995	248	421
Percentage of persons infected	15.24	12.22	2.15	7.38
Number of cases of congenital syphilis	2,612	777	140	244
Percentage of cases of congenital syphilis	46.93	38.93	56.45	57.71
Number of cases of acquired syphilis ..	2,953	1,218	108	177
Percentage of cases of acquired syphilis ..	53.07	61.07	43.55	42.24

	Depart. of Vidin	Depart. of Vratza	Depart. of Plevna	Depart. of Burgas	Total
tage of cases of ary syphilis ..	0.14	0.08	—	—	0.11
tage of cases of ndary syphilis.	17.88	5.25	—	—	13.29
tage of cases of ary syphilis ..	81.98	99.67	100.00	100.00	86.60
er of persons ted by the anti- ilis detach- ts	4,992	1,584	221	288	7,085
tage of persons ted by the anti- ilis detach- ts	89.70	79.40	89.10	68.40	86.10

ne anti-syphilis detachments proceed as follows : On arriving in a village, the ment examines the whole population ; in suspected cases the blood is sent by courier to the Bacteriological Institute at Sofia or to the clinic of venereal taneous diseases. While awaiting the results of the blood tests, the detachment ds to examine the population of the next village ; having done this, it returns first village and begins treatment. When the treatment is over, the detachment n to the next village, and so on. The detachment begins with the principal tants, priests, mayors, teachers, etc. In diagnosing syphilis, attention is given to the anamnesis and the clinical symptoms : mucous patches, ulcerations of the and nose, skin symptoms ; scars, acute or chronic inflammation of the bones ts. For the diagnosis of congenital syphilis, account is taken, in addition to ymptoms, of atrophy, anæmia, distrophic processes of the teeth, and in doubtful ecourse is had to the Wassermann test. 2,206 blood tests were made, with 50.7 nt positive reactions.

ne treatment adopted is as follows : When the clinical symptoms are conclusive Wassermann test positive, intravenous injections of neo-salvarsan and mercury ans of intra-muscular injections or rubbing. Infants are treated with yellow of mercury *per os* and in serious cases by intra-muscular injections of neo-salvar- Cases of latent syphilis are treated with mercury (injections or rubbing). Iodide assium is also prescribed.

he results of the treatment have been excellent, and the population displays gratitude and great confidence in the doctors of the detachments. The dispen- r venereal and cutaneous diseases at Sofia examined, from the time it was opened he end of 1924, 7,121 persons, of whom 4,537 were men and 2,584 women. he dispensary treated in 1925 : 1,364 syphilis cases, of whom 712 were men and omen ; 850 cases of gonorrhœa (500 men and 350 women) ; and 218 cases of ancre, including 18 women.

) *Malaria.*—In 1925, there were 13 malarial districts in Bulgaria, covering a total f 9,552 sq. km. The population of these districts was 661,756 inhabitants ; calities were recognised to be infected with malaria (495 in 1924). The staff ly detached for the campaign against malaria in 1925 included 12 malaria medical tors, 16 microscopical experts and 541 agents for the distribution of quinine. cases of malaria (14 per cent of the population of the malarial districts) were in 1925 (62,074, or 9.5 per cent, in 1924, and 77,862, or 12 per cent, in 1923).

The greatest number of cases observed was in August and September. 91,9 tests were made, 28,131 (30 per cent) of which gave positive results The nating form was tertian fever (27,760 cases, or 73.7 per cent) ; next came tropi (6,793 cases, or 24.1 per cent) ; quartan fever (392 cases, or 1.4 per cent) miscellaneous cases (0.6 per cent). The relation between tropical fever an fever was as 1: 3 (1 : 2 in 1924 ; 1 : 3 in 1923). The number of deaths from in the malarial districts was 254 (4 per 10,000 inhabitants), of which 73 wer department of Burgas. Out of 33,330 school-children examined in the districts, 10,203 (30.6 per cent) had enlarged spleens (in 1924, 32 per cent ; 192 cent). The *Anopheles maculipennis* was most frequently observed in 1925 (in mately 95 per cent of the cases).

Malaria was less prevalent in Bulgaria in 1925 than in previous years. Th logical conditions were very unfavourable to the breeding of mosquitoes—hea in the spring, great heat and strong winds in summer. The first two genera mosquitoes were unable to develop in favourable conditions. 12,000 litres o leum were employed in sterilising stagnant waters. Next year petroleum replaced by Paris green.

1,800 square meters of wire-netting were employed for protecting dw especially public buildings. Attempts to destroy mosquitoes in winter were ma poor results owing to lack of practical experience and propaganda in this di

The curative administration of quinine was carried out according to the method, which requires a treatment of from seven to eight weeks. In the c the winter, the Inspectorate of Malaria treated 2,400 patients and obtained 2,1 (87 per cent). Quinine was administered as a preventive measure to the em of the compulsory labour service in the departments of Burgas and Varn morbidity among persons having taken quinine as a preventive measure was cent, as compared with 28 per cent among other persons. 481 kilogram quinine were distributed (600 in 1924 and 523 in 1923).

The Inspectorate of Malaria began in 1925 the construction of a malari institute at Burgas, which will be completed next year. The sums necessary work will be taken from the fund for the campaign against malaria, which am to 4,853,857 leva on December 31st, 1923, and 5,675,243 on December 31st, 19

(d) *Trachoma.*—The number of cases of trachoma observed in the hospit dispensaries was :

1921	604
1922	678
1923	524
1924	503
1925	315
Total	2,624

The department of Rustchuk had the largest number of trachoma cases (24 cent) ; next come the departments of Philippopolis (9.48 per cent) and Sofi per cent).

In the course of the last five years, 1,444 cases of trachoma were observed towns (Rustchuk, 354 ; Sofia, 232 ; Philippopolis, 169 ; Sliven, 139) ; and 1 the villages.

Trachoma in Bulgaria is not very infectious ; in the majority of cases attacks one eye. The new Public Health Law prescribes compulsory notifi of trachoma and certain special measures against this disease.

Narcotic Drugs.—The International Opium Convention has been approved Central Medical Board and laid before the Sobranyé for ratification.

lection of Maternity and Children.

Protection of Maternity.—In 1925, medical assistance was given to expectant s by the Sofia Maternity Home (obstetrical clinic of 140 beds), by the obstetrical of the first-class hospitals of Varna, Plevna, Philippopolis and Rustchuk (total ls) and by all the other hospitals. These various establishments gave medical ice in 1,750 confinements in 1924 (1,654 in 1923 ; 1,715 in 1922 and 1,594 in

1925, there were 1,231 midwives (1,227 in 1924), of whom 207 were in the service Departmental Councils and 79 in the service of the communes.

Protection of Children.—As in previous years, the medical assistance of children en entrusted to the pediatric clinic at Sofia and to all the hospitals and saries of the country.

ve consulting centres for children organised by the Bulgarian Red Cross Society ed in 1925 (three in 1924). The consultations were given by four doctors, l by four probationary doctors. 580 children were brought to the consultations; ctors made 1,827 visits and the visiting nurses 3,969.

ie Foundlings Home of Sofia established by the Eudoxia Welfare Society bsidised by the Public Health Department sheltered, in 1925, 305 children, of 274 were infants. 39 children left the home, 55 were adopted and 103 died. ortality was 37.59 per cent (41.98 per cent in 1924 ; 57.14 per cent in 1923 ; er cent in 1922). The causes of death were bronchial pneumonia (32 cases), ital debility (20 cases) ; dyspepsia (15 cases), etc.

) *School Hygiene.*—In 1925, there were 3,857 public buildings used for elementary s. Of this number, 1,774 were suitable for this purpose, 980 will become r repairs, and 1,103 are unsuitable. 1,171 public buildings are used for ary schools. 538 are suitable for this purpose, 301 will have to be repaired 2 are unsuitable. Nine-tenths of the private buildings used as schools are nsuitable for the purpose. With a view to improving the hygiene of school ngs, the Ministry of Education laid before the Sobranyé a Bill on the co- ive building of elementary schools, which was passed on June 30th, 1924. ial fund has been constituted, to which the State and the communes have outed ; towards the end of 1925, this fund amounted to about 40 million leva. ? school colonies were established in 1925, with 2,771 pupils. The Public Health tment granted subsidies of 405,000 leva to 26 colonies. 15 school canteens ed with 375 boarders.

l) *Protection of Adolescence.*—The Association for the Campaign against Juve- rime and the Protection of Prisoners, founded in 1917, has, with the help of the and of private societies, constructed a welfare home in the neighbourhood of In 1925, 119 persons were admitted, 37 of whom were minors and 82 adults.

otection of Other Groups.

a) *Protection of Workers.*—The "Law on the provision of work to the unemployed n unemployment insurance" was adopted in 1925. All the towns with more than workmen must organise labour exchanges for the purpose of finding employment orkers. Workers without employment for eight days will be entitled to a dole leva a day if they have families and of 10 leva a day for twelve weeks if they are lors.

(b) *Protection of Refugees.*—In 1925, the State granted 20 million leva for th ment of refugees. 51,000 families benefited from the assistance of the State 250,000 persons). Having exhausted the financial resources at its dispos Government is now endeavouring to obtain a loan to assist the refugees.

4. *Applied Hygiene.*

During the year 1925, the State, the departments and the communes di than in the previous years to improve the health conditions of the country, part as regards the water supply of the different localities.

(a) *Water Supply.*—The fund established for making loans to communes purpose of undertaking water supply, drainage, electric lighting and public works is administered by a special office at the Ministry of Finance. This formed by taking 15 per cent from the gross yield of the communal taxes. 1931, 80 per cent of the fund will be reserved for the commune of Sofia for its supply works ; the communes of the dry districts of the departments of Ru and Sumen, known as the " Deli-Orman " districts, will employ the remaining cent un il 1929. The benefit of this system of loans will then be extended to th communes, due consideration being given to the importance of the work the to undertake from the point of view of public health. The communes will interest of 4 per cent.

The carrying-out of the water-supply scheme of the town of Sofia, which pr to utilise the water of seven small lakes in the Rila mountains and of the flowing from them, has been begun. The water conduit will have a flow cubic meters per second. In the Deli-Orman district, which constantly suffers shortage of drinking water, two central stations will be constructed, with res and water conduits providing a supply of water for 30 villages. This work w about 100 million leva.

Of the 57 towns in Bulgaria whose population exceeds 5,000 inhabitants, 35 p an up-to-date water-supply system ; 16 of them were provided with this s before 1924 ; the others established it in 1924-25. 99 villages possess an up-t water-supply system, 35 of which established it in 1924 and 33 in 1925.

The Government has granted 747,000 leva of subsidies to 57 poor commun the construction of public fountains and wells, and has furnished 69 commune pipes to the value of 15 million leva.

The Public Health Department has drawn the attention of the district m officers to the sanitary condition of the springs ; many of them have studie question and have discussed it at meetings of the Health Councils.

(b) *Removal of Refuse.*—The Roads and Highways Board in 1925 had 367 for the removal of refuse and 602 mechanical sweepers, including 223 for the to Sofia.

(c) *Drainage of Marshy Districts.*—The large drainage works begun by the H Health Department have been resumed by the Ministry of Agriculture and State L

The Inspectorate of Malaria has decided to confine itself henceforward to drainage works.

In 1925, 1,403,419 square meters of land were drained. This work cos Inspectorate of Malaria 3,185,165 leva, and represents 74,601 square meters of c 127,500 cubic meters of embankments and 83,289 cubic meters of excavations

(d) *Public Buildings.*—Of the 57 towns of more than 5,000 inhabitants, 43 p public baths ; there are also 50 Turkish baths ; 41 villages possess 47 mineral b

Housing Problem.—The census of December 21st, 1920, showed that in the kingdom there were 860,276 houses or habitable buildings, of which 178,142 n the towns and 862,134 in the villages.

here is an average of 5.42 inhabitants per house in the towns and 5.69 in the s. In 1925, there was a housing shortage in 18 towns. The State granted es to the communes totalling 36,500,000 leva to enable them to make loans co-operative societies (70 millions in 1924).

Inspection of Foodstuffs.—The number of analyses carried out by the Chemical te in the last five years is as follows :

	Foodstuffs	Forensic medical examinations	Pharmaceutical examinations	Chemical examinations	Other examinations	Total
. . . . .	217	72	504	88	—	881
. . . . .	621	82	443	114	—	1,260
. . . . .	1,654	123	792	85	—	2,254
. . . . .	974	235	505	73	—	1,787
. . . . .	1,646	139	864	31	467	3,147

he Health Institute carried out 551 examinations in 1925, including 175 analyses dstuffs and 366 of specimens of drinking water.

he number of analyses carried out by the Customs laboratories and departmental mmunal laboratories is as follows :

	Foodstuffs	Forensic medical examinations	Pharmaceutical examinations	Chemical examinations	Other examinations	Total
ns laboraes	3,221	—	4	—	1,004	4,229
tmental labories.. ..	1,182	6	49	49	811	2,097
unal laboraes	7,651	5	63	517	118	8,354
otal ..	12,054	11	116	566	1,933	14,680

Campaign against the High Cost of Living.—Taking 100 as the index of the ge cost of living from 1901 to 1910, the index in 1925 was 3,982 (3,763 in 1924 ; in 1923). The Central Food Supply Commission was abolished in 1925. A er of communes still have food-supply commissioners.

Health Statistics.—The Health Statistics Service of the Central Public Health tment has dealt with the question—hitherto neglected—of the certification of s in localities possessing a doctor. It has collected information on the causes ath in 63 of the towns of Bulgaria.

his information is published in the Monthly Bulletin of the Central Statistical tment. Information regarding the causes of death in the first six months of ear 1925 has already been published.

ne of the doctors sent to the United States of America with a scholarship ed by the Rockefeller Foundation, to specialise in health statistics, will devote ief attention to this branch.

Health Propaganda.—Health propaganda in 1925 was carried on by the Socier the Campaign against Tuberculosis and Alcoholism, by the Union of Bulgarian

Doctors, and by certain medical practitioners. The Central Public Health ment prescribes that each time a district medical officer proceeds to a locality t a case of infectious disease he must give a lecture on that disease.

The Public Health Department has organised a competition with prizes authors of the best propaganda writings on infectious diseases in general and infectious diseases in particular.

On the initiative of the Public Health Department and with the assistanc Ministries of the Interior, of Education, and of Commerce and Labour, the Re Society, the Anti-Alcoholism Office, the Society for the Campaign against Tuber the Union of Bulgarian Doctors, the Society of Dermatology and the Uni Extension Committee, a Committee for Health Propaganda was organised at t of 1925.

This Committee will begin its activities at the beginning of 1926.

IV. CURATIVE MEDICINE AND HEALTH PERSONNEL.

1. *Hospitals.*

115,372 persons had recourse to the dispensaries of the hospitals (136,399 in 877,428 to the dispensaries of the district, communal, etc., medical officers (1,1 in 1924) ; these establishments therefore treated 992,790 persons in 1925 (1,2 in 1924 and 1,389,604 in 1923).

The number of hospitals carrying on their activities during the last two y shown in the following table :

Hospitals	1925 Number	1925 Beds	1924 Number
First-class	15	3,573	15
Second-class	13	613	17
Third-class	40	600	30
Special	6	560	4
Private	19	348	19
Belonging to charitable organisations	4	275	4
Total	97	5,969	89

The Sofia maternity home has 140 beds, the Iskretz Sanatorium 170 (100 in the Troian Sanatorium 70, the Varna Marine Sanatorium 200 (170 in 1924), a four homes for incurable lunatics 360 (330 in 1924).

Of these 97 hospitals, 66 are maintained by the State, seven by the Departn Councils, four by charitable societies, one by the commune of Rustchuk, and private persons.

The number of bed patients treated in the hospitals was 95,310 (100,388 in and 76,486 in 1923) ; the average length of treatment was 13.28 days (10.95 in 16.95 in 1923). The cost of a day's hospital treatment is about 75 leva.

The " Law on the relief of persons suffering from the effects of the w adopted in 1925, stipulates that war invalids, orphans and widows should r free medical attendance.

2. *Pharmacies.*

The number of pharmacies amounted to 456 (354 in 1924), of which 159 b to the Central Public Health Department, 99 to the Departmental Councils, communes, and 198 to private persons. Of the 159 pharmacies belonging t

Health Department, 69 are in the State hospitals and 90 in the dispensaries of trict doctors. In addition, each feldscher in charge of a section possesses a harmacy containing the drugs he is entitled to administer. Of the 99 pharmacies ing to the Departmental Councils, four are in departmental hospitals and 95 in pensaries of the district medical officers paid by the Departmental Councils.

llh Personnel.

the end of 1925, there were :

242 *doctors* of Bulgarian nationality authorised to practise in the country, of 39 had concluded their studies at the Sofia Faculty of Medicine in the course year. The number of doctors established in Bulgaria (including the Russian provided with a temporary authorisation) was about 1,360 (1,166 at the end 4).

3 *dentists* (27 more than in 1924).

8 *pharmaceutical chemists* (24 more than in 1924), of whom 32 were in the service Central Public Health Department, 24 in communal pharmacies, and 66 in pharmacies.

4 *assistant chemists* (81 more than in 1924), of whom 59 were in the service of ntral Public Health Department, 51 in the communal pharmacies and 202 in pharmacies.

231 *midwives*, including 783 authorised to practise in the towns (763 in 1924) 48 country midwives.

735 *feldschers* of Bulgarian nationality and 39 feldschers of Russian nationality ted in 1925 in the compulsory labour service.

0 *nurses*, five of whom had completed during the year their courses at the g school of the Bulgarian Red Cross Society.

1924, Bulgaria possessed 167 *veterinary surgeons*, 116 of whom were in the ser- the State, eight in the service of the departments, 22 in the service of the ines, and 21 in private practice ; in addition, there were 408 veterinary iers.

1925, the Sobranyé adopted an amendment to the " Law on the pensions ed to staff having suffered during the campaign against plague, cholera and ". Persons having lost their health as a result of taking part in this campaign cality declared to be infected by the Central Medical Board will be entitled to ns. In the event of their decease, their heirs are entitled to a pension which exceed 24,000 leva per annum. Persons who have lost 50 per cent of their capa- r work are entitled to a pension equal to 20 to 50 per cent of their previous salary.

he Public Health Department organised in 1925 a conference of the depart- l medical officers at Sofia and conferences of the district medical officers in the towns of the departments.

wo bacteriological specialists were sent to America with scholarships offered Rockefeller Foundation to pursue special studies ; on their return, one will be ited chief and the other deputy-chief of the Sofia Health Institute. Three doctors also received scholarships from this Foundation to specialise in health istration, the protection of children and the campaign against venereal diseases tively.

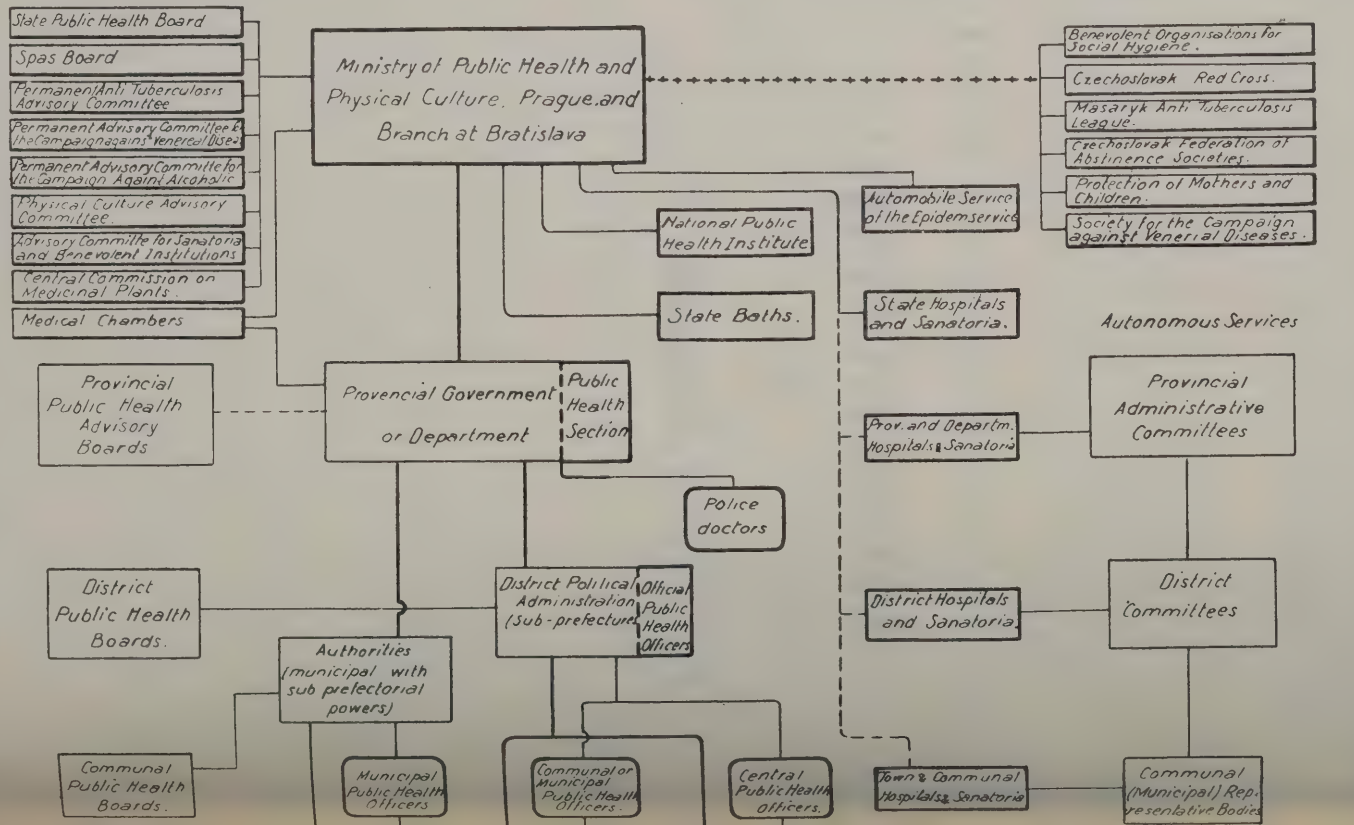
lay 1926.

CZECHOSLOVAKIA

BY

Pr. Jaroslav HRDLIČKA (Prague)

CZECHOSLOVAK REPUBLIC
PUBLIC HEALTH ORGANISATION


ADVISORY ORGANS:
EXECUTIVE ORGANS:
SPECIAL AND TECHNICAL ORGANS
PRIVATE ORGANISATIONS:
State Public Health Board
Spas Board
Permanent Anti Tuberculosis Advisory Committee
Permanent Advisory Committee for the Campaign against Venereal Diseases
Permanent Advisory Committe for the Campaign Against Alcoholic
Physical Culture Advisory Committee
Advisory Committe for Sanatoria and Benevolent Institutions
Central Commission on Medicinal Plants
Medical Chambers
Ministry of Public Health and Physical Culture, Prague and Branch at Bratislava
National Public Health Institute
State Baths
Automobile Service of the Epidemservice
State Hospitals and Sanatoria
Benevolent Organisations for Social Hygiene
Czechoslovak Red Cross
Masaryk Anti Tuberculosis League
Czechoslovak Federation of Abstinence Societies
Protection of Mothers and Children
Society for the Campaign against Venerial Diseases
Autonomous Services
Provincial Public Health Advisory Boards
Provencial Government or Department
Public Health Section
Police doctors
Prov. and Departm. Hospitals & Sanatoria
Provincial Administrative Committees
District Public Health Boards
District Political Administration (Sub-prefecture)
Official Public Health Officers
District Hospitals and Sanatoria
District Committees
Authorities (municipal with sub prelectorial powers)
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Communal or Municipal Public Health Officers
Central Public Health Officers
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I. GENERAL INTRODUCTION.

rea :

0,394 square kilometers.

opulation :

he figures given by the National Statistical Office for 1924 and 1925 are as :

	1924	1925
Bohemia	6,845,839	6,878,308
Moravia	2,756,857	2,775,515
Silesia	710,407	717,075
Slovakia	3,148,780	3,176,785
Sub-Carpathian Ruthenia	654,962	665,959
Total..	14,116,845	14,213,642

(a) POPULATION BY SEX, 1910-25.

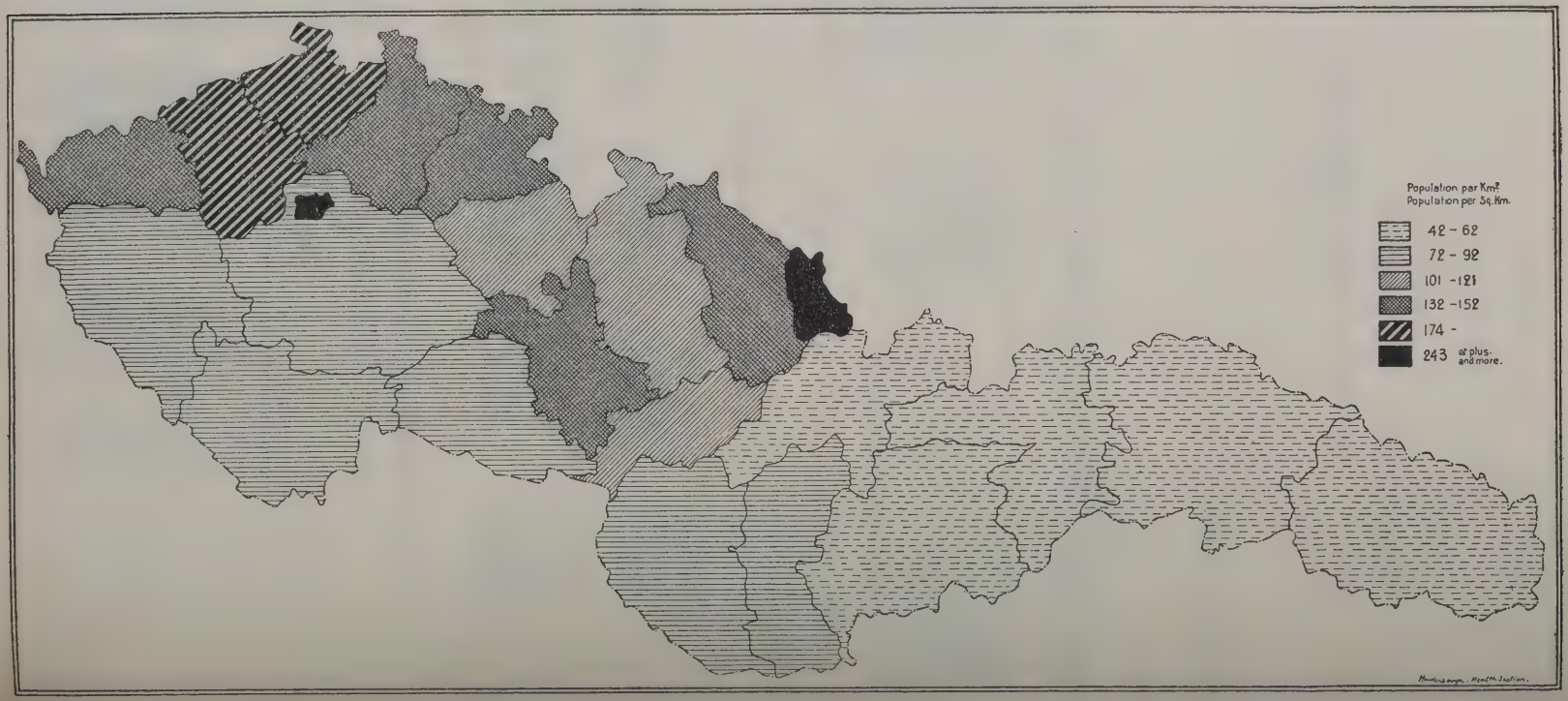
	Males	Females	Total	
.. ..	6,614,942	6,982,659	13,596,601	Austrian census 1910
.. ..	6,559,503	7,053,669	13,613,172	Census of February 15th, 1291.
.. ..	6,608,299	7,158,992	13,767,291	(Estimated)
.. ..	6,711,705	7,271,021	13,982,726	
.. ..	6,776,083	7,340,762	14,116,845	
.. ..	6,822,547	7,391,095	14,213,642	

(b) MOVEMENT OF POPULATION, 1919-25.

Rate per 1,000 Inhabitants.

	Marriages	Births		Total	Deaths	Excess of Births over Deaths
		Live Births	Still-births			
.. ..	13.44	22.37	0.52	22.89	18.42	3.95
.. ..	12.54	26.60	0.65	27.25	18.96	7.64
.. ..	11.96	29.02	0.66	29.68	17.70	11.32
.. ..	10.60	28.05	0.67	28.72	17.60	10.45
.. ..	9.30	27.26	0.67	27.93	15.01	12.25
.. ..	8.96	25.84	0.65	26.49	15.35	10.49
.. ..	9.22	25.11	0.57	25.68	15.22	9.89

Density of the population of Czechoslovakia by provinces at the census of 1921



Iortality.

(a) GENERAL DEATH RATE, 1924 : 15.35 per 1,000.

(b) DISTRIBUTION OF DEATHS BY PROVINCES, 1923-25.

Province	Number of Deaths in 1925			Mortality per 1,000 Inhabitants		
	Males	Females	Total	1923	1924	1925
ıia	49,041	48,097	97,138	13.87	14.24	14.12
ia	19,490	19,709	39,199	14.02	14.11	14.12
.. .. ..	4,897	4,768	9,665	13.55	14.15	13.47
kia	28,204	27,776	55,980	17.59	18.03	17.62
arpathian Ru- ıia	6,462	6,414	12,876	20.54	20.74	19.33
Total	108,094	106,764	214,858	15.01	15.35	15.12

(c) MORTALITY BY PROVINCES, 1922-25.

Rate per 1,000 Inhabitants.

Province	1922	1923	1924	1925
Bohemia	23.1	22.5	21.84	20.64
Moravia	25.7	25.2	24.43	23.30
Silesia	30.1	28.5	27.12	26.28
Slovakia	36.9	36.-	34.62	32.27
Sub-Carpathian Ruthenia ..	46.8	43.6	44.44	41.27
Total for the whole Republic	28.05	27.26	25.84	24.96

(d) MORTALITY FROM PRINCIPAL CAUSES OF DEATH, 1923-25.

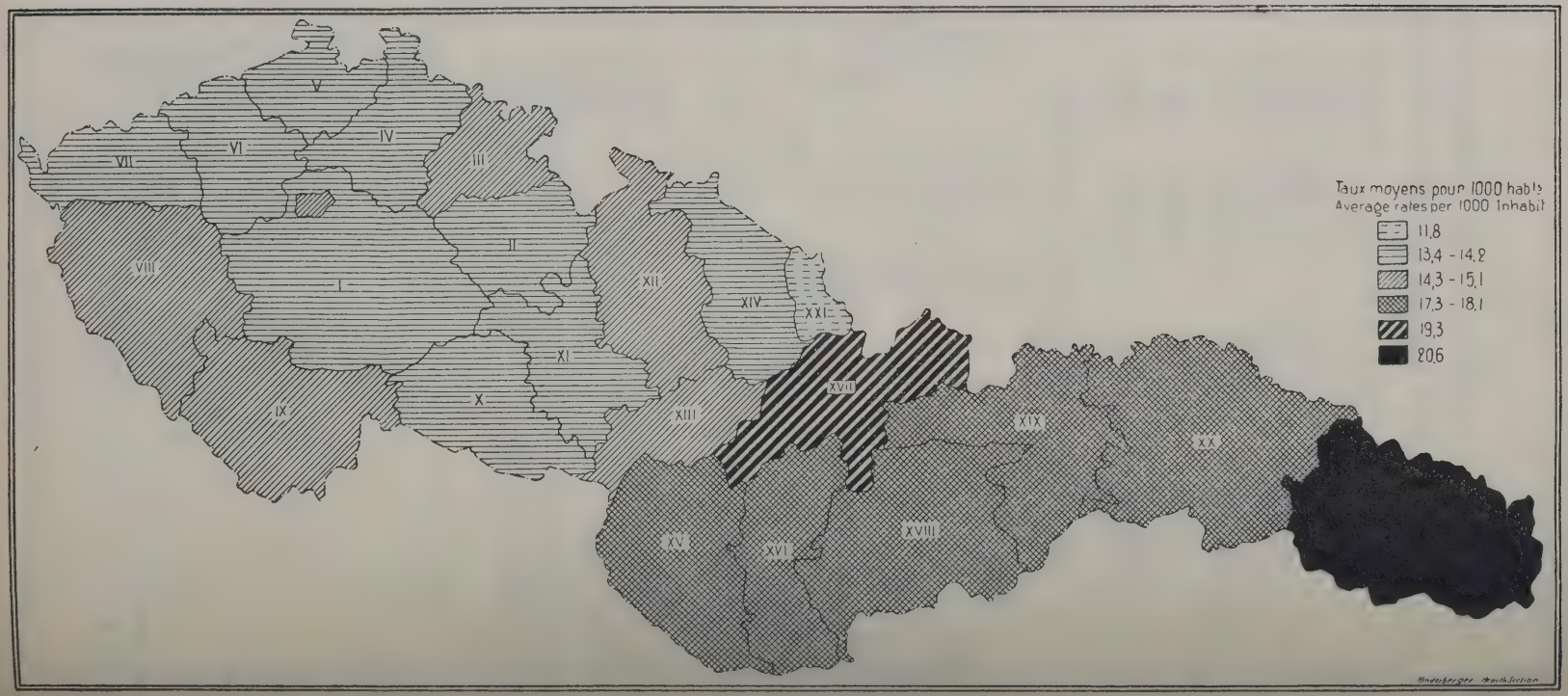
Rate per 100,000 Inhabitants.

Cause of Death	1923	1924	1925
ınary Tuberculosis	171.6	170.1	172.2
culosis in other Organs	20.6	20.5	21.2
ıonia	122.0	131.8	146.2
r and Malignant Tumours	90.7	96.8	98.8
es of the Circulatory System	142.9	160.1	168.3
y	212.6	225.5	188.6

(e) DISTRIBUTION OF DEATHS BY AGE, 1924-25.

Age: Years	Population 1925 (estimate)	Number of Deaths 1924	Number of Deaths 1925	1925 Specific Mortality by Age (per 1,000 inhabitants)
0- 4	1,139,933	66,691	64,697	56.75
5-14	3,210,861	5,603	5,502	1.71
15-24	2,986,285	11,983	11,980	4.01
25-39	2,838,463	16,415	16,747	5.90
40-59	2,797,244	33,082	33,370	11.93
60-79	1,162,675	65,053	52,791	45.40
80 and over	65,382	16,534	16,733	255.59
Unknown	12,722	350	648	—

General Death rates in Czechoslovakia—Geographical distribution, 1923-1924.



(f) SEASONAL DISTRIBUTION OF DEATHS 1923-25.

Month	1923	1924	1925
January	19,391	18,247	19,397
February	18,272	17,278	17,024
March	20,086	20,580	20,143
April	19,320	19,974	21,064
May	18,560	19,738	19,765
June	16,324	16,927	16,883
July	16,925	17,097	17,138
August	16,170	16,523	16,145
September	15,662	15,385	15,713
October	15,894	16,818	16,427
November	15,419	17,832	16,038
December	16,811	19,195	19,518

(g) NUMBER OF DEATHS AND MORTALITY BY CAUSES OF DEATH, 1923-25.

r in ial List ses ath	Cause of Death	1923	1924	1924 Mortality per 100,000 inhabitants	1925	1925 Mortality per 100,000 inhabitants
	Enteric and paratyphoid fever	1,042	1,130	8.04	1,134	7.98
	Typhus fever	23	13	0.09	12	0.08
	Malaria or malarial cachexia	46	24	0.17	227	0.19
	Smallpox	50	33	0.23	38	0.27
	Measles	920	1,378	9.81	1,487	10.46
	Scarlet fever	1,206	708	5.04	507	3.57
	Whooping-cough	1,599	1,028	7.32	1,769	12.45
	Diphtheria	675	645	4.59	680	4.78
2-16	Influenza with complications	743	595	4.23	1,189	8.37
	Relapsing fever, Malta fever, miliary fever, mumps, Asiatic cholera, choleriform enteritis, dysentery	505	357	2.54	209	1.47
	Erysipelas	322	388	2.76	382	2.69
	Lethargic encephalitis	209	193	1.37	227	1.60
8	Epidemic cerebro-spinal meningitis	77	52	0.37	76	0.53
	Glanders and farcy, malignant pustules, anthrax, rabies	46	47	0.33	39	0.27
7	Tuberculosis of the respiratory organs	23,729	23,899	170.08	24,480	172.23
	Other forms of tuberculosis	2,897	2,873	20.45	3,012	21.19
2, 25, 0, 42	Syphilis	426	471	3.35	458	3.22
9	Other endemic, epidemic and infectious diseases	1,935	2,090	14.87	2,464	17.34
	Cancer and other malignant tumours	12,458	13,608	96.84	14,025	98.67
58	Diabetes	712	746	5.31	712	5.01
3	Benign tumours (except diseases of the female genital organs), rheumatism, gout, scurvy, pellagra, beri-beri, rickets, anæmia, chlorosis	1,422	1,503	10.70	1,560	10.98
5	Diseases of the pituitary gland, the thyroid and parathyroid glands, the thymus gland and the suprarenal capsules	179	302	2.15	368	2.59
	Diseases of the spleen, leucæmia and Hodgkin's disease	176	164	1.17	210	1.48
9	Alcoholism	235	221	1.57	335	2.36
	Other general diseases	85	50	0.36	54	0.38
5b	Meningitis	2,028	2,040	14.52	2,038	14.34
	Locomotor ataxy and progressive paralysis	679	829	5.90	829	5.83
5a, c, 1	Cerebral hæmorrhage, apoplexy	7,182	7,678	54.64	8,593	60.46
	Other diseases of the spinal cord and the brain	9,342	9,109	64.83	7,955	55.97
6 0	Other diseases of the nervous system	909	785	5.59	773	5.44
6	Pericarditis, endocarditis or acute myocarditis, angina pectoris and other diseases of the heart	15,356	17,154	122.08	18,121	127.49
	Other diseases of the circulatory system	4,623	5,340	38.00	5,799	40.80
01	Bronchitis	2,829	2,889	20.56	2,946	20.73
02-107	Pneumonia	16,876	18,516	131.77	20,776	146.17
12	Other diseases of the respiratory system	5,356	5,940	42.27	6,929	48.75
	Ulcer of the stomach or duodenum and other diseases of the stomach (cancer excepted)	1,083	1,090	7.76	1,191	8.38

(g) NUMBER OF DEATHS AND MORTALITY BY CAUSES OF DEATH, 1923-25 *(con*

Number in International List of Causes of Death	Cause of Death	1923	1924	1924 Mortality Per 100,000 inhabitants	1925
113	Diarrhœa and enteritis under 2 years of age	11,093	10,333	73.54	10,3
122	Cirrhosis of the liver	409	413	2.94	4
108-110, 114-121, 123-127	Other diseases of the digestive system	4,479	4,769	33.94	4,8
128, 129	Nephritis	3,061	3,241	23.07	3,3
130-136	Other non-venereal diseases of the genito-urinary system	742	768	5.47	8
137-142	Benign tumours of the ovary and non-cancerous uterine tumour, metritis, other diseases of the female genital organs and non-puerperal diseases of the breast	166	140	1.00	1
146	Puerperal septicæmia	555	425	3.02	5
143-145, 147-150	Other puerperal diseases	678	700	4.98	6
151-155	Diseases of the skin and of the cellular tissue	1,170	1,101	7.84	1,0
156-158	Diseases of the bones and of the organs of locomotion	297	239	1.70	2
159	Congenital malformations (still-births not included)	293	286	2.04	2
160*b*, 161	Congenital debility, premature birth and injury at birth	21,570	20,972	149.25	18,9
160*a*, 162, 163	Other diseases peculiar to early infancy	195	36	0.26	
164	Senility	29,730	31,689	225.52	26,8
165-174	Suicide	3,552	3,397	24.18	3,5
175-182	Poisonings (except Nos. 25, 67 and 68), burns, suffocation, accidental drowning	1,416	1,569	11.17	1,6
183-189	Accidental traumatism	1,456	1,646	11.71	1,6
190	War wounds	79	50	0.36	
192	Starvation (deprivation of food or water)	14	20	0.14	
197-200	Homicide and infanticide	300	237	1.69	2
191, 193-196, 201-203	Other external violence	640	817	5.81	8
204, 205	Sudden death, causes of death not specified or ill defined	8,869	8,975	63.87	6,9
	Total	**208,834**	**215,711**	**1,535.16**	**214,8**

4. *Infant Mortality.*

(a) INFANT MORTALITY, 1924 AND 1925.

Province	Number of Live Births		Number of Deaths under 12 months old		Number o per 1 of Live-bo under 12 m
	1924	1925	1924	1925	1924
Bohemia	144,474	142,019	20,258	19,032	140.2
Moravia	65,521	64,683	8,630	8,460	131.7
Silesia	18,681	18,865	2,800	2,534	149.9
Slovakia	106,056	102,507	17,074	17,200	161.0
Sub-Carpathian Ruthenia	28,424	27,482	4,994	4,725	175.7
Total	363,156	355,556	53,756	51,951	148.0

(b) LIVE BIRTHS AND DEATHS UNDER 12 MONTHS, PRAGUE, 1910-1924.

Year	Number of Live Births	Number of Deaths under 12 months old	Mortality of Infants under 12 months old per 1,000 Live Births
ue and the suburbs of Karlin, Smichov, Vinohrady, Vzsovice and Zizkov, 1910-24.			
1910	8,498	1,487	175
1911	8,303	1,508	182
1912	8,040	1,337	166
1913	7,726	1,055	137
1914	6,971	934	134
1915	5,150	754	146
1916	4,000	511	128
1917	3,538	523	148
1918	3,397	499	147
1919	5,409	602	111
1920	7,452	941	126
1921	7,673	900	117
1922	7,640	851	111
1923	7,030	654	93
1924	6,270	623	99
Greater Prague, 1921-25			
1921	11,534	1,619	140
1922	11,522	1,468	127
1923	10,493	1,104	105
1924	9,523	1,104	116
1925	9,711	1,067	110

irths and Birth Rate.

(a) BIRTH RATE, 1925 : 24.96 per thousand.

(b) GENERAL STILL-BIRTH RATE, 1924 AND 1925.

Province	Number of Births						Number of Still-births per 1,000 births	
	Live Births		Still-births		Total			
	1924	1925	1924	1925	1924	1925	1924	1925
ia	144,474	142,019	4,582	4,107	149,056	146,126	30.7	28.1
a	65,521	64,683	1,545	1,249	67,066	65,932	23.0	18.9
.. ..	18,681	18,865	478	432	19,159	19,297	24.9	22.4
ia	106,056	102,507	2,217	2,011	108,273	104,518	20.5	19.2
rpathian Ruthenia	28,424	27,482	355	323	28,779	27,805	12.3	11.6
.. ..	363,156	355,556	9,177	8,122	372,333	363,678	24.6	22.3

(c) STILL-BIRTH RATE BY LEGITIMACY, 1925.

vince	Number of Children						Rate per 1,000 births			
	Legitimate			Illegitimate			Legitimate		Illegitimate	
	Live-born	Still-born	Total	Live-born	Still-born	Total	Live-born	Still-born	Live-born	Still-born
ia	123,517	3,312	126,829	18,502	795	19,297	973.9	26.1	958.8	41.2
a	58,399	1,065	59,464	6,284	184	6,468	982.1	17.9	971.6	28.4
.. ..	16,878	356	17,234	1,987	76	2,063	979.3	20.7	963.2	36.8
ia	94,756	1,792	96,548	7,751	219	7,970	981.4	18.6	972.5	27.5
rpathian ienia ..	24,951	270	25,221	2,531	53	2,584	989.3	10.7	979.5	20.5
.. ..	318,501	6,795	325,296	37,055	1,327	38,382	979.1	20.9	965.4	34.6

Birth rates in Czechoslovakia—Geographical distribution, 1923–1924.

udget.

. General Budget for the Financial Year 1925 (in Czechoslovak crowns) :

	Ordinary	Extraordinary	Total
Expenditure	7,025,723,696	2,547,862,105	9,573,585,801
Receipts	8,926,549,700	374,784,719	9,301,334,419

. Budget of State Investments for the Financial Year 1925 :

otal credits applied for : 1,319,083,000 Czech crowns.

udget for Public Health and Physical Culture (Chapter XXIII of General t) :

	Ordinary	Extraordinary	Total
Expenditure	97,435,909	28,965,914	126,401,823
Receipts	25,604,583	—	25,604,583

uilding work authorised by the Ministry of Public Health and payable out of the ies budget : 19,500,000 Czech. crowns.

udget of the Ministry of Social Welfare :

	Ordinary	Extraordinary	Total
Expenditure	455,682,376	338,459,219	794,141,595
Receipts	5,800,800	4,142,594	9,943,394

uilding work payable out of the investments budget : 2,200,000 Czech crowns.

rincipal Items of the Health Budget :	Expenditure	Receipts
	Czech crowns	
l administration	5,608,782	123,000
institutions :		
ı, physical culture, hospitals, maternity homes, Institute of Dental Medicine	41,600,096	20,962,325
tion of children, Model Institute for Nurslings, sanaoria for children	2,668,759	1,032,300
ory Councils	89,000	—
tion of springs and wells	20,000	—
res to prevent and control epidemics	1,991,500	—
ign against general and social diseases (scrofula, berculosis, alcoholism, venereal diseases, trachoma, ckets and mental diseases)	8,102,400	—
lsory vaccination	200,000	—
f youth	3,468,000	—
al culture	2,268,000	—
l instruction	400,000	—
al measures for the improvement of health	5,580,000	—
l provisions	409,000	—
f adhering to international health conventions	60,000	—
ls for nurses	900,000	—
e for use of radium (rent)	920,000	—
: Food Institute	5,000	—
s to baths and bathing establishments	150,000	—
s for the construction of hospitals	2,500,000	—

	Expenditure Czech	Re crowns
Cost of treatment	14,690,000	2,4
Health departments in public administrations	34,532,287	2
Police Medical Service	921,823	
Schools of midwifery	1,227,077	1
Profits on exploitation of State watering-places	—	6
Grants for medical students (Ruthenia)	15,000	

II. HEALTH LEGISLATION.

1. *School Medical Officers.*

Ministerial Decree of April 4th, 1925, bringing into application the Law c 13th, 1922 (National Code No. 226), amending the laws on primary and higher p schools.

Paragraph 4 of this decree prescribes the duties and powers of school m officers. They must carry out two detailed inspections annually and visit the v classes, paying special attention to infectious diseases and their prophylaxis supervise the physical development of the pupils and the teaching of physical c issue certificates of exemption from gymnastic courses, grade pupils in different according to their physical aptitudes and personally direct courses of thera gymnastics.

2. *Industrial Hygiene.*

Ministerial Decree of May 26th, 1925, on the protection of the lives and of the workers.

This decree applies particularly to :

(a) Workers employed in quarries, clay-pits, gravel-pits, etc. ;
(b) Workers in the building industry ;
(c) Workers employed in sugar factories ;
(d) Workers employed in printing, lithographic and type-founding work
(e) Workers in the paper-making industry.

3. *Establishment at Brünn of an Institute for the Analysis of Foodstuffs.*

Ministerial Decree dated June 13th, 1925 (National Code No. 146), issu the Ministers of Public Health and Justice, establishing at Brünn an institute f analysis of foodstuffs.

This institute, which was opened on July 1st, 1925, will serve the provin Moravia and Silesia, which have hitherto had to depend upon the correspo institutes at Prague.

4. *Execution of the International Opium Convention of* 1912.

Ministerial Decree of June 18th, 1925 (National Code No. 147), putting into paragraph 6 of the Law of May 29th, 1923 (National Code No. 128), regardi execution of the International Opium Convention of January 23rd, 1912.

Under this decree, district and municipal medical officers have to supervi production, importation, exportation and distribution of the substances refer in the Convention and to see that the provisions of that Convention are duly c

fect. The decree further lays down the regulations governing the importation portation of narcotics, particularly raw opium.

stablishment of the National Health Institute.

aw of October 12th, 1925 (National Code No. 218), establishing a National Health te at Prague.

his institute, which is placed under the Ministry of Public Health and Physical e, carries out scientific work under the instructions of the State Health Admini-n, develops the teaching of preventive medicine and is training a staff of health ists. It will include a central institute at Prague and branches, which will be shed as far as possible at the higher schools and will specialise in certain of the ic activities of the central institute.

ithin the limits of its powers, and subject to its internal regulations, which will down by ministerial decree, the National Health Institute will give help and to all public services (State, departmental and communal) and to all bodies viduals who may apply to it.

ie internal regulations of the institute will determine in what cases the institute authorised to make charges for its work. The scale of these charges and the of the preparations which the institute will manufacture for sale will be fixed by the Ministry of Public Health and the Ministry of Finance.

ie institute is managed by a director, who has under him an assistant director. ff will consist of technical officials, who will carry out scientific work, an account-epartment, a secretariat and subordinate staff.

ere will be a special advisory board, attached to the Ministry of Public Health, will study all technical questions relating to the activities of the institute and e its opinion as to the merits of the technical staff. The composition of this nd its rules of procedure will be laid down by special decree.

the authorities of the Republic (State, departmental and communal) will ired to assist the institute.

e Ministers of Public Health, Education and Finance are responsible for the on of this law.

alth Insurance.

w of October 15th, 1925 (National Code No. 221), regarding the health ce of employees in the public services.

e following are insured against sickness :

) Civil employees of the State and its undertakings and members of the police

) Teachers at primary and higher primary schools which come under the Parity May 23rd, 1919 (National Code No. 274);

) Employees of the provincial autonomous services, federations of departments, nents, districts, communes and the institutions which are placed under these ties ;

) Persons in receipt of a pension from the State or from one of the bodies ned in paragraph *(c)* if such persons are domiciled within the Republic and already insured against sickness under the Law of October 9th, 1924 (National o. 221);

) Employees of private administrations who have been placed by ministerial on the same footing as officials of public administrations.

The insurance of priests and spiritual heads of religious communities rec by the State and of teachers in primary or higher primary public schools not under paragraph *(b)*, whether active or retired on pension, will be provided a subsequent decree.

The law grants to the insured person and the members of his family free m treatment (including obstetrical assistance) and supplies of medicines and other peutic material. Where necessary, treatment in a hospital or similar inst (general class) will be provided in place of these benefits, the patient being co from his home to hospital and back free of charge. If the insured has to take in a locality other than that where he resides, his travelling expenses will b together with those of any person who has to accompany him. Special regu will be laid down for cases where the insured is allowed to receive treatment specialist and where the insurance organisation is authorised to refund the dental operations and of special treatment.

The insured can choose his own doctor from among the medical practitio the district who accept the terms laid down by the Central Insurance Com When circumstances so require, however, this Committee can organise a medical service.

Insurance costs are borne by the Public Officials' Sickness Insurance Fund, has its headquarters at Prague. It is administered by a central committee board of directors. A board of five members will be appointed in each distri will consist of the sub-prefect of the district or his deputy, and four members by the insured.

The law determines the powers of the central committee, provides for the c of special sickness insurance funds for wage-earners in State undertakings, preparation of a statute for the Sickness Insurance Fund and for State supervi the Fund. The annual subscription is fixed at 2 per cent of the wages or pen the insured, half of this amount being paid by the employer and half by the i In the case of unpaid workers, the employer finds the whole of the contributio

Disputes between the Insurance Fund and the insured will be settled conciliation tribunal.

7. *Service Instructions for the Use of Medical Officers of Communes (town Districts and Chief Medical Officers of Towns.*

Ministerial Circular No. 10991, of April 10th, 1925.

This circular lays down the powers, rights and privileges of the above-men officials.

8. *Anti-Rabies Treatment.*

Ministerial Circular No. 8400, of April 10th, 1925.

This circular indicates the procedure to be followed in sending to the P Institute of Prague persons who have been bitten by animals suffering or sus of suffering from rabies.

9. *Supervision of Pharmacies in Slovakia and Sub-Carpathian Ruthenia.*

Ministerial Circular No. 10989, of May 19th, 1925.

This circular prescribes the cases in which the proprietor of a pharmacy ma his establishment to be conducted by a qualified substitute, or may let it on l

III. INFECTIOUS DISEASES.

cidence of and Mortality from Infectious Diseases, 1920-25 [1].

Per 10,000 Inhabitants.

ease	Number of Cases						Deaths					
	1920	1921	1922	1923	1924	1925	1920	1921	1922	1923	1924	1925
ria	3.54	3.21	2.34	2.17	2.53	2.93	0.47	0.34	0.24	0.17	0.18	0.23
ry	5.94	6.03	1.05	1.11	0.93	0.49	0.81	0.70	0.10	0.07	0.07	0.04
ıg fever . .	0.01	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l fever . .	5.33	6.84	4.80	4.96	4.88	4.81	0.70	0.71	0.47	0.30	0.37	0.38
spinal me-												
is	0.08	0.06	0.14	0.10	0.10	0.11	0.03	0.03	0.06	0.03	0.04	0.04
. . . .	0.13	0.09	0.06	0.19	0.09	0.14	0.01	×	0.00	0.00	0.00	0.00
ever. . .	3.15	6.90	7.82	7.56	6.87	8.82	0.14	0.66	0.88	0.54	0.32	0.21
. . . .	2.14	0.71	0.23	0.26	0.03	0.14	0.48	0.08	0.02	0.01	×	×
x	3.23	1.13	0.05	0.03	0.01	×	0.56	0.23	0.01	0.00	×	×

= less than 0.01.

1925, there were also recorded the following :

thrax	47 cases ; 4 deaths.
cephalitis lethargica	189 cases ; 43 deaths.
ratyphoid	87 cases ; 1 death.
bies	8 cases ; all fatal.
achoma	3,235 cases.

ıgraphical Distribution of Infectious Diseases by Provinces during 1925 [2].

inces	Typhoid fever		Para-typhoid fever		Typhus exanth.		Malaria		Dysen-tery		Cere-bro-spin. mening.		An-thrax		Rabies		Puerp. fever		Small-pox		Scarlet fever		Diphtheria	
	c.	d.	c.	d.	c.	d.	c.	d.	c.	d.	c.	d.	c.	d.	c.	d.	c.	d.	c.	d.	c.	d.	c.	d.
. . . . .	2,042	218	84	3	1	–	6	–	92	9	46	27	11	2	8	8	363	165	–	–	7,067	136	2,119	202
l Silesia . .	1,912	147	2	–	–		–	–	102	1	54	17	3	–	–	–	129	53	–	–	3,348	73	767	55
. . . . .	2,130	128	–	–	10	1	21	–	283	28	46	10	19	–	–	–	64	12	3	1	1,804	80	1,169	68
ian Ruthenia	650	50	–	–	193	2	171	–	228	32	9	5	15	1		–	10	4	–	–	324	11	169	10
k Republic . .	6,734	543	86	3	204	3	198	–	705	60	155	59	48	3	8	8	566	234	3	1	12,543	300	4,224	335

cases.
deaths.

mpaign against Infectious Diseases.

(a) GENERAL PREVENTIVE MEASURES.

e epidemiological situation called for no special measures during 1925 ; the iological service which we described in the *Year-Book* for 1924 proved fully te for the prevention or suppression of epidemics.

[1] number of cases and deaths from notifiable diseases recorded in 1925 may be found in *Ep demiological* e, No. 10, page 138.
[2] piled from the 1925 *Monthly Epidemiological Reports* of the Health Section of the League of Nations.

The health station for Silesia is now completed and the work is proceed the construction of the material depot of the State epidemiological service.

The National Health Institute of Prague was formally inaugurated on No 5th, 1925, although only the first set of buildings was complete. This group i separate buildings for the administrative services, epidemiological diagnos Pasteur Institute, the serological service and the vaccine institute, stabl These buildings cost about 15 million Czech crowns.

The institute started work at the beginning of September 1925.

(b) SPECIAL MEASURES AGAINST TYPHOID FEVER.

Under the heading " Work in connection with Public Sanitation " will be a description of the measures adopted for the prevention of typhoid fever.

Nevertheless, we will here mention the regulations applied in Moravia, wh prevalence of this disease in certain districts has led the health authorities dur last few years to select such a district in which to make certain sanitary ments. The places chosen were the little village of Kvasitz, on the banks of the M and, farther east, the town of Zlin, in the Drevnitz valley, to which the atten the health authorities had been drawn on account of the widespread epide typhoid fever reported in the first volume of the *International Health Year-Book* The Business Committee of the Office for Investigation and Reform attached Ministry of Health ordered an enquiry in this district. Thanks to material ai the Czechoslovak Red Cross and from an important industrialist of the dist question, a member of this Committee, Professor of Hygiene at Brünn, orgar " squad " consisting of fourteen medical students from Brünn, and made an tigation on the spot in February 1925. This group of men visited all the hous drew up on special forms certain data relating to the construction of the hous to the inhabitants. It made a particular study of the supply of drinking-wat of the removal of sewage and refuse. Many samples of water used as drinking were submitted to bacteriological and chemical analysis at the Institute of at Brünn. The general health of the commune was also thoroughly investi During this enquiry, which was pursued for twelve days, with the assistance district medical officer, 1,410 houses at Zlin and in twelve neighbouring lo were visited. Two hundred and fifty-five samples of water were submitted to riological and chemical analysis. The enquiry led to the conclusion that w public sanitation was imperative and in particular a change in the system of pro drinking-water.

This sanitation work was divided up as follows :

(1) Supply of drinking-water for the large local boot-and-shoe factory a the group of dwelling-houses connected with it ;
(2) Supply of drinking-water for the town ;
(3) Supply of drinking-water for the rural communes.

The management of the factory reconstructed and enlarged its water co which will probably suffice for the requirements of the western part of the tow the new water conduit there has been completed. The rest of the town will be su by fifteen wells, which will be reconstructed and fitted up so as to comply wi requirements of modern hygiene.

(c) DISINFECTION.

t the end of 1924, Czechoslovakia possessed the following disinfecting installa-

Province	Steam Disinfectors (various systems)		Steam Disinfectors (emergency)		Formol Disinfectors
	Fixed	Mobile	in connection with a steam engine	in connection with a heating apparatus	
ia	208	275	15	43	1,670
ia	90	66	13	19	195
	32	19	17	58	91
ia	33	138	171	139	431
ırpathian Ruthenia	10	10	—	—	16
)tal	373	508	216	259	2,397

IV. SOCIAL DISEASES.

ıberculosis.

(a) MORTALITY IN 1924.

ıe actual number of deaths from tuberculosis in 1924 was slightly higher than the previous year, namely : of 26,772 deaths, 23,899 were from pulmonary ılosis (89.3 per cent), and 2,875 from other forms of tuberculosis (10.7 per cent), pared with 26,626 deaths in 1923.

:vertheless, if account is taken of the increase in population and the rise in ıeral mortality rate, the mortality figure for tuberculosis (190.5 per 100,000 ants) has fallen ; the percentage of total deaths was 12.41.

(b) MORTALITY IN THE DIFFERENT PROVINCES IN 1923 AND 1924.

1923, the number of deaths from tuberculosis decreased by :

13 per cent in Bohemia ; 15 per cent in Moravia ; 12.1 per cent in Silesia.

ıring 1924, this declining tendency persisted, as shown below :

Bohemia, 1 per cent ; Moravia, 3.5 per cent ; Slovakia, 1.1 per cent ; Sub-Carpathian Ruthenia, 2.6 per cent.

Silesia, on the other hand, the number of deaths from tuberculosis increased per cent, perhaps on account of the industrial crisis prevailing in that country ; industry, ironworks and foundries).

GEOGRAPHICAL DISTRIBUTION OF MORTALITY FROM TUBERCULOSIS, 1923-25.

Per 10,000 Inhabitants.

Province	Pulmonary Tuberculosis			Tuberculosis of other Organs		
	1923	1924	1925	1923	1924	1925
a	15.27	14.85	15.25	2.34	2.27	2.21
ı	17.28	16.87	17.06	2.95	2.80	3.06
a	16.91	17.98	116.94	2.90	2.87	3.28
rpathian Ruthenia	20.14	20.34	20.39	0.75	0.90	1.06
lovak Republic	22.59	23.21	24.39	1.19	0.87	1.02
	17.16	17.01	17.22	2.06	2.04	2.12

(d) MORTALITY IN 1925.

The provisional statistics for 1925 give a total of 214,888 deaths, of which
were from tuberculosis (pulmonary tuberculosis 24,480 ; other forms 3,012), tha
say, a specific mortality of 195.9 per 100,000 inhabitants and 12.81 per cent o
deaths. Accordingly, mortality from tuberculosis shows a certain, although
slight, increase in 1925. It is not yet possible to say whether this increase is due
well-known periodic fluctuations which are characteristic of this mortality, or w
it is due to influenza, which has reappeared in the country in an endemic form

(e) DISTRIBUTION BY AGE-GROUPS OF MORTALITY FROM TUBERCULOSIS AT PI
1911-24.

Per 100,000 civilian inhabitants aged :

Year	0—1 yr	1—4 yrs	5—9 yrs	10—14 yrs	15—19 yrs	20—24 yrs	25—29 yrs	30—34 yrs	35—39 yrs	40—44 yrs	45—49 yrs	50—54 yrs	55—59 yrs	60—64 yrs	65—69 yrs	70—74 yrs	75—79 yrs	80 years and over	Number of Deaths per 100,000 civil. inhab.
									Number of Deaths from										
Pulmonary Tuberculosis.																			
1911	363	256	75.7	87.7	265	330	383	384	440	379	329	368	328	470	394	311	142	106	3
1912	345	202	52.4	66.5	270	283	325	409	399	340	352	380	311	390	346	274	105	52.4	2
1913	170	158	29.8	50.9	243	314	338	324	341	322	292	305	390	362	320	174	240	103	2
1914	251	166	48.3	62.2	274	287	324	267	421	289	334	335	385	274	315	297	102	102	2
1915	263	188	50.4	90.1	300	268	349	383	295	379	397	443	425	403	425	131	213	106	2
1916	195	195	96.1	109	366	319	381	329	381	453	480	456	520	542	509	443	184	111	3
1917	206	197	101	87.7	414	342	375	316	333	363	488	598	676	575	669	405	329	54.8	3
1918	235	182	113	84.0	448	333	374	320	221	292	353	477	681	739	998	776	350	158	3
1919	263	220	137	86.2	280	264	295	293	279	337	422	373	462	449	488	626	576	356	2
1920	486	114	95.5	83.0	228	267	266	248	282	242	262	273	300	299	222	140	101	50.4	2
1921	387	81.6	33.6	46.8	170	174	166	180	159	192	194	282	312	395	336	193	258	—	1
1922	401	141	23.7	33.2	147	211	190	180	206	204	218	270	277	218	304	325	185	238	1
1923	141	59.6	16.3	38.3	97.2	146	159	139	164	132	201	211	274	279	225	243	91.2	330	1
1924	269	122	20.7	46.7	115	144	163	151	165	183	155	185	226	198	350	240	360	—	1
Tuberculosis (all Forms).																			
1911	714	525	151	133	305	341	402	406	474	403	358	399	380	492	469	344	177	106	3
1912	628	471	143	98.6	303	304	337	431	427	376	375	415	379	491	367	290	140	105	3
1913	412	361	114	72.8	274	323	363	352	355	351	331	352	451	384	371	190	275	103	3
1914	395	315	115	95.8	306	304	350	312	437	315	369	377	445	323	336	360	102	102	3
1915	425	372	97.9	120	334	277	366	415	332	439	458	505	489	418	479	229	284	106	3
1916	364	406	189	148	391	356	403	358	413	474	522	493	568	603	642	562	221	111	3
1917	400	417	179	129	459	371	408	349	360	384	550	676	794	718	713	540	365	164	4
1918	408	361	171	119	485	359	412	366	241	315	380	525	778	847	1,082	905	455	263	3
1919	383	322	195	117	312	281	311	317	312	356	434	394	473	477	549	642	576	356	3
1920	616	225	127	99.6	264	285	282	262	298	258	274	290	321	340	232	155	101	50.4	2
1921	561	240	67.1	69.2	187	187	174	196	177	209	216	303	381	432	392	227	281	48.3	2
1922	601	357	56.8	64.6	171	224	210	208	224	227	254	296	315	283	366	347	185	238	2
1923	386	278	39.7	51.0	108	161	175	153	180	156	229	243	308	316	266	365	182	330	1
1924	473	357	34.5	59.3	127	155	172	162	172	201	181	236	274	248	410	283	360	46.4	1

GENERAL MORTALITY AND BIRTH RATE IN 1924; MORTALITY FROM PULMONARY ERCULOSIS AND FROM CANCER AND MALIGNANT TUMOURS IN 1923 AND 1924.

Department	General Mortality	Births	Mortality from Pulmonary Tuberculosis		Mortality from Cancer and Malignant Tumours	
	per 1,000 inhabitants		per 10,000 inhabitants			
	1924	1924	1923	1924	1923	1924
I. Prague	13.98	22.20	14.07	14.05	11.28	11.92
Prague (city)	15.01	18.49	18.85	18.64	15.57	16.82
I. Pardubitz	13.81	21.56	17.55	17.72	10.34	10.17
I. Hradec Krabové	14.81	20.37	18.65	17.77	12.39	12.48
/. Boleslav Mladá	14.08	19.01	17.44	16.77	12.86	13.33
V. Ceska Lipa	13.57	18.38	14.10	13.23	12.36	13.07
I. Louny	13.69	22.36	15.13	14.25	10.27	12.09
I. Carlsbad	13.85	23.36	13.66	12.17	11.33	11.30
[. Pilsen	15.03	22.78	13.25	13.22	9.16	9.81
[. C. Budejovice	14.60	22.56	10.60	11.54	10.86	11.66
[. Jihlava	14.05	23.52	14.10	14.25	11.52	12.71
I. Brünn	13.58	22.73	16.10	16.40	11.67	12.61
I. Olmütz	15.10	23.65	19.38	18.11	12.40	13.51
I. Uherské Hradiste	14.25	27.24	16.84	16.41	8.76	9.69
. Moravska Ostrava	14.42	24.51	18.57	19.51	8.47	9.07
[. C. Tesin	12.21	27.79	16.24	15.89	4.95	5.69
/. Bratislava	17.18	32.22	21.17	21.11	4.91	5.04
I. Nitra	18.37	33.75	20.76	21.64	3.52	4.31
I. Turc. Sv. Martin	19.58	37.93	21.44	21.90	2.63	3.15
. Zvolen	17.32	28.90	20.77	20.25	3.73	3.92
. Lipt. Sv. Mikulas	18.07	33.81	18.33	20.00	4.31	4.06
. Košice	18.34	37.56	17.93	17.62	3.06	3.43
Sub-Carpathian Ruthenia.	20.74	43.89	22.59	23.21	2.49	2.95

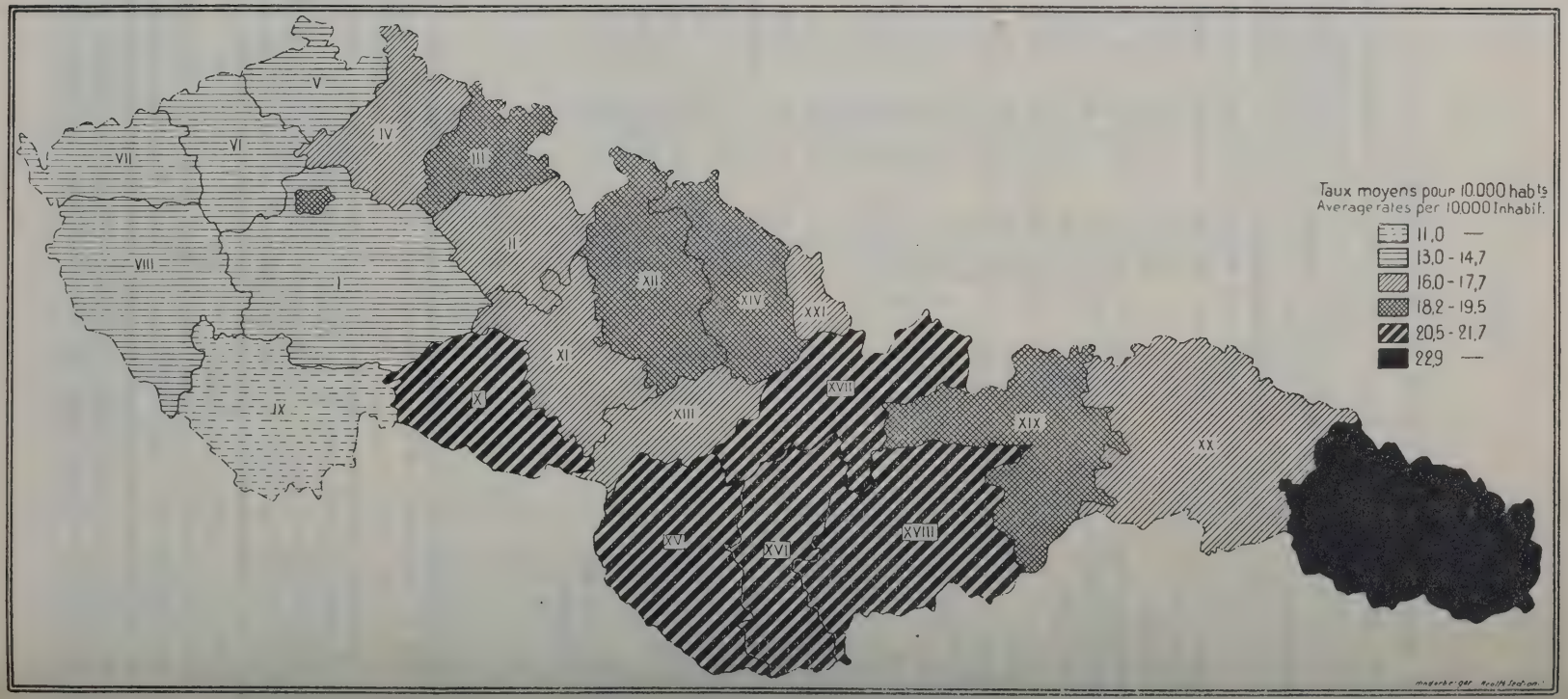
(g) PREVENTIVE MEASURES.

ıe work of establishing anti-tubercular dispensaries was actively pursued during There are at present 18 large combined dispensaries—popular institutes of ıygiene—*i.e.*, two more than in 1924. Seventy new anti-tubercular dispenproperly so called have been added to the 114 which we mentioned in the first of the *International Health Year-Book* ; many of these were founded by the yk Anti-Tuberculosis League. This association, the headquarters of which are gue, and its numerous sections (278 at present, which is an increase of 73 over ıre doing very important propaganda and educative work ; they also arrange sending of patients to sanatoria.

o new children's sanatorium was established in 1925, but existing institutions nlarged and improved. In particular, a ward for lung cases and another for ere added to the provincial institute for tuberculous children at Luze.

ıere are at present in Czechoslovakia 21 sanatoria for adults, 5 for children and cial wards for tuberculous cases in the hospitals, making a total of more than ıeds.

Geographical Distribution of Pulmonary tuberculosis Mortality in Czechoslovakia, 1923–1924.



'he expenditure of the Ministry of Public Health on the campaign against tuber- s increased during 1925 to 8,300,000 Czech crowns, not including the sums paid ıe hospital treatment of tuberculous cases admitted to public hospitals in kia and Sub-Carpathian Ruthenia.

enereal Diseases.

n execution of paragraph 15 of the Law of July 11th, 1922 (Collection of Laws Ordinances, National Code No. 241), homes are now being established for the ıent and training of fallen girls who have contracted venereal diseases. The hhrana " Association at Prague will shortly be establishing two homes of this at Dolni-Pocernice and Kralupy nad Vlt ; the German Society for combating eal Disease at Prague will establish one at Usti nad Laben, and a fourth will ınded at Bratislava (Slovakia).

onsulting-rooms have been opened at the Prague railway stations, and this ole will shortly be followed by Bratislava and Košice. The Zilina Branch of the oslovak Red Cross has opened an anti-venereal dispensary. The State hospital ague (Vinohrady) has placed at the disposal of the commune of Prague 30 beds ung girls suffering from venereal diseases. On March 1st, 1925, a Wassermann n was inaugurated at the Trencsen departmental hospital ; a centre for the osis and treatment of venereal diseases has been established at Bratislava. In ıia, a venereal ward with 72 beds has been fitted up at the hospital at Most. er, the municipal hospital at Pilsen has added a special ward for venereal cases venereal consulting centre has been opened by the Institute of Social Hygiene e Pardubitz district.

he Ministry of Public Health grants annual subsidies to associations engaged in mpaign against prostitution and venereal disease. These subsidies amounted 5 to 320,000 Czech crowns.

ı Slovakia and in Sub-Carpathian Ruthenia, the State refunds to hospitals the f treating indigent syphilitics with salvarsan ; in 1925, this amounted to 84,700 crowns. In 1925, the expenditure of the Ministry of Public Health on the enereal campaign amounted to about 1,200,000 Czech crowns.

lcoholism.

he Czechoslovak Temperance League at Prague has organised a systematic ign against alcoholism. With the assistance of its branches at Bratislava and od and with financial help from the State, it conducts intense propaganda by ılets, periodicals, advertisements, exhibitions, etc. Other smaller societies, ocialist Temperance Association, the Freethinkers' Temperance Section, the rs for God and, among the German-speaking population, the German Tempe- League, the Workers' Temperance Association, the Lodge of the Good Templars, lso co-operate in this work.

he State has granted a special subsidy to the branch of the Czechoslovak rance League founded at Užhorod, in Sub-Carpathian Ruthenia, in the autumn 5, to enable it to publish its propaganda in Ruthenian and Hungarian.

rachoma.

systematic campaign against trachoma was inaugurated in 1925 in those parts vakia most seriously affected by this disease, Prievidza, Rănovce and Velké

Geographical Distribution of Cancer Mortality in Czechoslovakia, 1923–1924.

ćany. Twenty-three main dispensaries and forty-two smaller stations were ished during the year. These institutions are placed under the supervision of ovincial medical officers and the sub-prefects. Visiting nurses attached to the l dispensaries are also responsible for the service of the auxiliary stations. The s and visiting nurses at these dispensaries receive special technical training at niversity of Bratislava. The establishment and upkeep of the dispensaries and chnical training of their staffs cost, in 1925, 430,000 Czech crowns.

he results justify the belief that the spread of trachoma has been successfully ed and appreciable relief afforded to existing cases. This campaign will later tended to neighbouring districts.

ancer.

EOGRAPHICAL DISTRIBUTION OF MORTALITY FROM CANCER AND MALIGNANT TUMOURS, 1923-1925.

Per 10,000 Inhabitants.

ince	1923	1924	1925
nia	11.60	12.29	12.24
ia	10.69	11.46	11.61
	7.64	8.65	9.51
kia	3.76	4.06	4.66
arpathian Ruthenia	2.49	2.95	3.29
oslovak Republic	9.07	9.68	9.88

V. PREVENTIVE MEDICINE AND HYGIENE.

hysical Culture.

he Ministry of Public Health has granted subsidies for the construction of 342 sia and for the purchase and equipment of playing-fields and training-grounds. cases, it has made grants to physical-culture societies and has given moral and ial encouragement to all kinds of athletic meetings, such as the International ic Congress, the International Hockey Congress, the International Football ess, the International Rowing Congress, the International Ski Competitions, etc. linistry also assisted the Workers' Gymnastic Association so as to enable it to art in the International Gymnastic Fête at Frankfort, and itself sent represen-s.

took the initiative in organising the exhibitions of physical culture held at Hradec vé and Krǒmeriz and at the Autumn Fair at Prague. It prepared and editeda ganda pamphlet entitled " Gymnastics and Sport in Czechoslovakia ". Eight al-culture instructors were sent to Sweden, Norway, Finland, France, Switzer-and Roumania to complete their training. Some 120 courses of physical e, lasting from one to ten days, were organised for a total of 7,000 persons. The s of Physical Education " have been translated and are at present in the press. ity of Prague will shortly possess a national institute of physical culture, the d for which has already been bought; in particular, it will include a swimming-n the right bank of the Moldau.

he Letna training-grounds at Prague had been turned to other uses, and had replaced by grounds to the west of the town, which have been leased for eighty

years by the municipality. The work of levelling and fitting up these groun being energetically pushed forward.

An Advisory Committee of Physical Culture has been appointed for three y and is entrusted with the study of the following questions : all kinds of sport ; compiling of a dictionary of gymnastic and athletic terms ; the standardisatic gymnasia.

The State has also granted a subsidy to the publishers in German of works of Tyrs, the celebrated physical-culture propagandist.

2. *Care of Youth.*

(a) INSTITUTIONS.

A new provincial institute for mentally deficient young persons of both s has been inaugurated at Oporany, in Bohemia. This establishment will have beds. It has been equipped in accordance with the most up-to-date principl hygiene and education.

The " For Our Children " dispensaries, which were founded by the American Cross and taken over in 1922 by a local organisation with the assistance of the Min of Public Health, have been supplemented by a new dispensary established at V (Moravia), in the midst of a mountainous district hitherto unprovided with institutions of this kind.

During 1925, the " For Our Children " dispensaries gave 1,119,696 medical sultations, and 21,755 children were treated there for the first time. Visiting n paid 158,507 visits to houses (more than 500,000 visits since 1921). Since July 1921, more than 100,000 children have been placed under observation.

(b) SCHOOL HYGIENE.

Numerous regulations have been issued and many questions settled by m terial circulars.

We may mention the publication in Czech of *The Legal Bases of the Social rance of Children*, by Dr. Tuma, of the Ministry of Social Insurance, and the *Rat Choice of a Profession*, a handbook of occupations for the use of parents, teachers doctors, published by the Central Office for Advice as to the Choice of a Career.

3. *Work in connection with Public Sanitation.*

The efforts of the Ministry have been mainly devoted to work in connection the supply of drinking-water. The most important of these works are : the v conduit of the Mšeno-Sedlec group, which will supply excellent drinking-wat 42 communes. The cost of building this aqueduct is estimated at 10 million C crowns. Twenty-six communes have already given their support to the sch while 17 are considering it. The Molheka water conduit, which supplies 22 comm and cost 4 millions, is now complete. The waterworks of the town of Tachau now been completed at a cost of 7 millions. Those for the town of Ceska-Skalitz finished, cost 3 millions. These works will be subsequently extended so as to su water to the neighbouring districts.

The town of Pilsen has completed the construction of a water filtration on the Puech-Chabal system (cost, 6 millions).

mong the water conduits begun in 1925 may be mentioned those of the towns
hin, estimated at 3 millions, Zamberk-Kunvald (2 millions), Besednitz-Nesmen
ion), Libaň (1 million) and Břeclava (4 millions).
he State has encouraged and subsidised the construction of public baths by
unes, societies and sickness insurance funds.
he province of Bohemia has spent about 50 million Czech crowns on water
ts and 30 millions on canalisation and public baths.
he province of Moravia has spent on water conduits, canalisation and public
25 million crowns, and Slovakia 15 millions.
he Ministry of Public Health has appropriated out of its public sanitation
3,241,476 crowns for water conduits, 1,297,722 for canalisation, and
4,000 crowns for the construction of public baths.

ealth Propaganda.

ie Health Administration organised a number of exhibitions for the rural and
populations : special exhibitions to encourage the campaign against typhoid
milk exhibitions, drinking-water exhibitions, exhibitions on dental hygiene,
micable diseases, the care of children, tuberculosis, etc. Some of these are
ing exhibitions, while others remain permanently in important centres. A
r of small poster exhibitions visit all parts of the country in turn. These
ions are supplemented by explanatory pamphlets. In this way, health pro-
la is carried into the most remote villages, where it has not yet been possible to
ilms or give lantern lectures.
ie Health Administration has organised the production or purchase of films
ntern slides and has promoted propaganda lectures.
ie first independent and complete public-health exhibition, with lectures, meet-
monstrations and cinematographic performances, was organised at Hradec-
é. The Prague Agricultural Exhibition, too, included a health section. The
this exhibition making a special appeal to the peasants was particularly success-
00,000 propaganda pamphlets on health under rural conditions were distri-
Such exhibitions were also organised in connection with the Prague Fairs
nilar arrangements were made by the local exhibitions at Krŏmeriz, Melnik and
rk.
vo hundred sets of posters on the care of children, tuberculosis and industrial
e have been placed at the disposal of medical officers of health and distributed
hout the country. Further, many lectures have been held in the towns and
s, and propaganda plays performed at most of the theatres.
ie Protection of Mothers and Children Association has published and distri-
to all young girls leaving school a book on the education of mothers, called
Threshold of Life. A pamphlet on venereal diseases has been published and
uted in thousands of copies through the public administrations and sickness
ice associations.
ie Ministry of Public Health has had circulars on cancer published. Propaganda
lets against cancer have also been widely distributed among the people. The
responsible for health propaganda co-operates with the Social Hygiene
sation and edits, on behalf of the Czechoslovak Red Cross, the monthly journal
The People's Health. He also collaborates with the Protection of Mothers and
n Association and with the propaganda section of the Ministry of Agriculture

VI. CURATIVE MEDICINE.

1. *Hospitals, etc.*

Constructions and Additions during 1925.

1. Hospital of the Department of Košice at Krompach : 64 beds (com and opened in 1925).
2. The Pezinok Institute, department of Bratislava, branch of the Sect Psychiatry at the Bratislava Hospital : 110 beds (completed and opened in
3. State Hospital at Prague (Vinohrady) : construction of an isolation with 66 beds for infectious cases.
4. General State Hospital at Bratislava : the isolation ward has had a added ; 50 extra beds.
5. State Hospital at Zabreh : isolation ward for infectious cases has been exte with 22 more beds.
6. State Hospital at Mukacevo : a hutment has been built, with 14 bed
7. The Humpolitz Hospital : construction of an isolation ward for infe cases, with 26 beds.
8. The Hospital at Boleslav-mladá : construction of a ward, with 20 bed
9. Institute for Tuberculous Children at Dol. Smokoved, Slovakia : iso wards extended.

The number of beds in Czechoslovak hospitals has been increased during th by 850.

2. *State Baths and Health Resorts.*

Additions and Repairs during 1925.

1. Tatra Lomnitz : new catchment of underground springs and the struction of the water conduit. Fitting and furnishing of hotels belonging State ; reconstruction of the swimming-baths and sun-baths.
2. Štrbské Pleso : purchase and repair of a villa.
3. Lubochna : purchase of furniture.
4. Sliac : reconstruction of the water conduit ; repair of premises; furn
5. Herlany : new catchment of water from the Geiser ; purchase of bui
6. Jachymov : purchase and repair of buildings.
7. Marienbad : purchase and repair of buildings.
8. Carlsbad : purchase of ground.

VII. GENERAL QUESTIONS.

1. *Housing Problem.*

During 1925, legislation in this sphere was confined to the Law of March 1925 (Collection of Laws and Ordinances, No. 48, National Code), which aims protection of tenants. The effects of this law will expire on March 31st, 1928. It the slow and gradual return of the right to the free disposal of accommodat pre-war premises, and it allows of a gradual increase in rents of from 50 to 1 cent over pre-war prices.

execution of the laws on buildings erected between 1919 and 1924, subsidies een granted for the construction of 3,641 rentable apartment houses, comprising dwellings, and of 22,163 private houses with 25,020 dwellings, making a total 24 buildings and 57,634 dwellings, the building cost amounting to 4 milliard illion Czech crowns.

he construction of these houses has provided 169,218 rooms, 1,621 small work- 1,232 business premises and 1,484 cottages for small agricultural landowners. using crisis has occupied the close attention of the Advisory Economic Committee Ministry of Social Insurance, which has taken various steps to spread the n of the housing problem over several years ending with 1926.

ckness Insurance.

(*a*) STATISTICS.

istics concerning Sickness Insuranceare published annually by the Ministry ial Welfare (Technical Section for Insurance).

he last volume appeared in 1926, and refers to the year 1923. It deals separ- with sickness insurance funds in Bohemia, Moravia and Silesia (*i.e.* the great ty of the funds in the Czechoslovak Republic) and those of Slovakia and Sub- hian Ruthenia. This division is necessitated by the legislative differences n these provinces.

A. BOHEMIA, MORAVIA, SILESIA.

he sickness insurance funds of which statistics are given in the annual report for are divided as follows :

281	district funds ;
25	agricultural district funds ;
50	independent funds attached to businesses and undertakings ;
60	funds belonging to corporations ;
5	funds belonging to private societies ;
14	funds belonging to properly registered mutual relief societies.
otal.. 435	sickness insurance funds.

here are in addition two independent funds for which no statistics have been ed.

he following figures show the work done by the societies during 1923 :

otal number of members		2,168,473
of which	1,460,242	men (673 per thousand)
	708,231	women (327 per thousand)
and	2,108,679	compulsory members
	59,794	optional members.
verage membership of each society		4,985
umber of members sick		993,291 (45.81 per cent).
of which	667,751	men (46.41 per cent)
	315,540	women (44.55 per cent).

Number of cases of sickness (excluding confinements) (60.27 per cent of insured persons).		1,3
of which	944,536 men (64.68 per c insured male members)	
	362,481 women (51.18 per female members, excluding c ments).	
Average cost of each case		375.99
Average duration of each case		19.8
Number of days' sickness excluding confinements		25,(
Average per member, including confinements: 12.48 days.		
17,267,793 men; average: 11.83.		
7,788,502 women; (confinements excluded) average 11; average n of days for confinements, 2.82.		
Average cost of one day's sickness		19.61
Number of confinements		
Average cost of a confinement		
Number of days sickness allowed for a confinement		1,9
698,556 for treatment during pregnancy;		
1,297,057 for treatment after confinement.		
Average period of incapacity owing to confinement		55.
Number of confinements per 100 women		
Number of nursing mothers		
Number of days for which nursing (breast-feeding) bonus was allowed		2,(
Daily average of patients registered:		
Men		
Women (including confinements)		
Total		
Number of deaths		
Men	10,739	
Women	3,654	
Average cost of one death		673.91
Death rate for both sexes		0.66 p
Men	0.74 per cent;	
Women	0.52 per cent.	

During this year the sickness insurance societies employed a staff of 3,091 p and paid for their salaries a total of 59,399,571 Czech crowns (average 19, per employee).

Budget for 1923.

Receipts.	Czech cr
Members subscriptions—compulsory	364,(
Members' subscriptions—optional	12,3
Subscriptions from employers	365,(
Arrears of subscriptions	1,(
Carried forward	743,(

	Czechoslovak crowns
Brought forward	743,749,944
st on movable and immovable property, and miscellaneous eceipts	37,643,740
Total	781,393,684

Expenditure.

ances to members and their families :

	Czechoslovak crowns
ickness allowances	305,477,382
ccident allowances	13,347,828
llowances for incapacitation during pregnancy	6,511,611
ursing bonuses	12,871,840
octors' fees	79,426,163
edicaments	49,569,332
ospital expenses and transport of patients	56,954,555
uneral expenses	9,699,617
llowances to members' families	69,936,707
llowances paid for cases of sickness during previous years	1,296,741
Total allowances	605,091,776
f administration	93,752,646
isations	10,653,392
n the exchange on securities	2,791,217
laneous expenses	13,571,923
Total expenditure	725.860,954
.. ..	438,718,883
(including 98,298,517 Czechoslovak crowns from landed property)	
ities	798,091,116

B. SLOVAKIA AND SUB-CARPATHIAN RUTHENIA.

n 1923, there were 29 district funds.

er of members		306,730
Male	232,502	
Female	74,228	
er of cases		104,725
(excluding confinements)		
Male	87,026	
Female	17,699	
er of days' sickness		2,469,264
Male	2,027,156	
Female	442,108	
er of confinements		3,865

Number of days' sickness allowed for confinements		1
during pregnancy	50,653	
after confinement	108,458	
Total number of cases (including confinements)		1
Total number of days of incapacitation (including confinements)		2,6
Number of nursing mothers		
Number of days of nursing		1
Number of deaths		
Male	1,385	
Female	345	

Receipts.

	Czech Cr
Total	89,0

Average per member : 290.26

Expenditure.

	Czech Cr
Total	81,2
Allowances for sickness	29,8
Allowances for confinements	2,3
Midwives' fees	1,0
Nursing bonuses	8
Doctors' fees	8,5
Medicaments	8,7
Hospital expenses and transport of patients	8,4
Expenses for stay at watering places and sanatoria	1,6
Funeral expenses	1,6
Total	63,2
Cost of administration	11,5
Control	3
Amortisations	3
Miscellaneous	4,7

The sickness insurance societies are grouped into Unions. These Unions :

1. Negotiate collective contracts with doctors, chemists, hospitals, etc.
2. Supply members with medicaments and orthopædic appliances the funds are not compelled to grant ;
3. Exercise supervision over patients ;
4. Organise campaigns for the prevention of disease ;
5. Found and support clinics, convalescent homes and pharmacies ;
6. Prepare statistics concerning insurance funds.

(*b*) ACTIVITIES IN 1925.

The Central League of Czech Sickness Insurance Funds includes associa which devote special attention to curative medicine. During 1925, a whole of buildings have been added to those already possessing modern dispensaries.

l League has established at its headquarters in Prague a sanatorium for ng cases of pulmonary tuberculosis. This institute has a complete electro-peutic and actino-therapeutic installation, a large X-ray apparatus, etc., of extensive use is made by the sickness insurance funds.

he premises of the Sickness Insurance Fund for the district of Prague, which begun in 1924, will not be finished until 1926.

ew sanatoria have been established. The Sickness Insurance Fund for the rady district has bought an establishment at Jince, which has been converted sanatorium and is now provided with all the improvements of modern thera-s, especially as regards hydrotherapy.

he Sickness Insurance Fund at Kolin has started to build a sanatorium at rad, a watering-place, for the treatment of cardiac affections.

he Pilsen District Fund has bought a villa at Letiny and converted it into a rium.

ost of the funds affiliated to the League are interested in the sanatorium at nice, which is reserved for the treatment of pulmonary diseases. During 1925, embers of these funds were treated at the Pistany baths.

he Central League employs 26 medical specialists at Prague.

s in former years, the sickness insurance funds sent many of their members' en away for holidays or to the seaside.

he League organises special courses for the officials of the sickness insurance with a view to encouraging and popularising sickness insurance.

rug Traffic.

ctive intervention by the authorities during 1925 has resulted in the almost ete suppression of the abuse of cocaine, which was beginning to take root in e. The Ministry of Public Health placed a considerable sum at the disposal Prague Chief of Police, to enable him to cope with drug-traffickers in the cafés ars.

uring 1925, the import of drugs amounted to 1,271,846.6 gr. (74,893.6 gr. of e and 1,196,953 gr. of opium and opium derivatives).

June 1926.

DENMARK

BY

Dr. H. J. HANSEN (Copenhagen)

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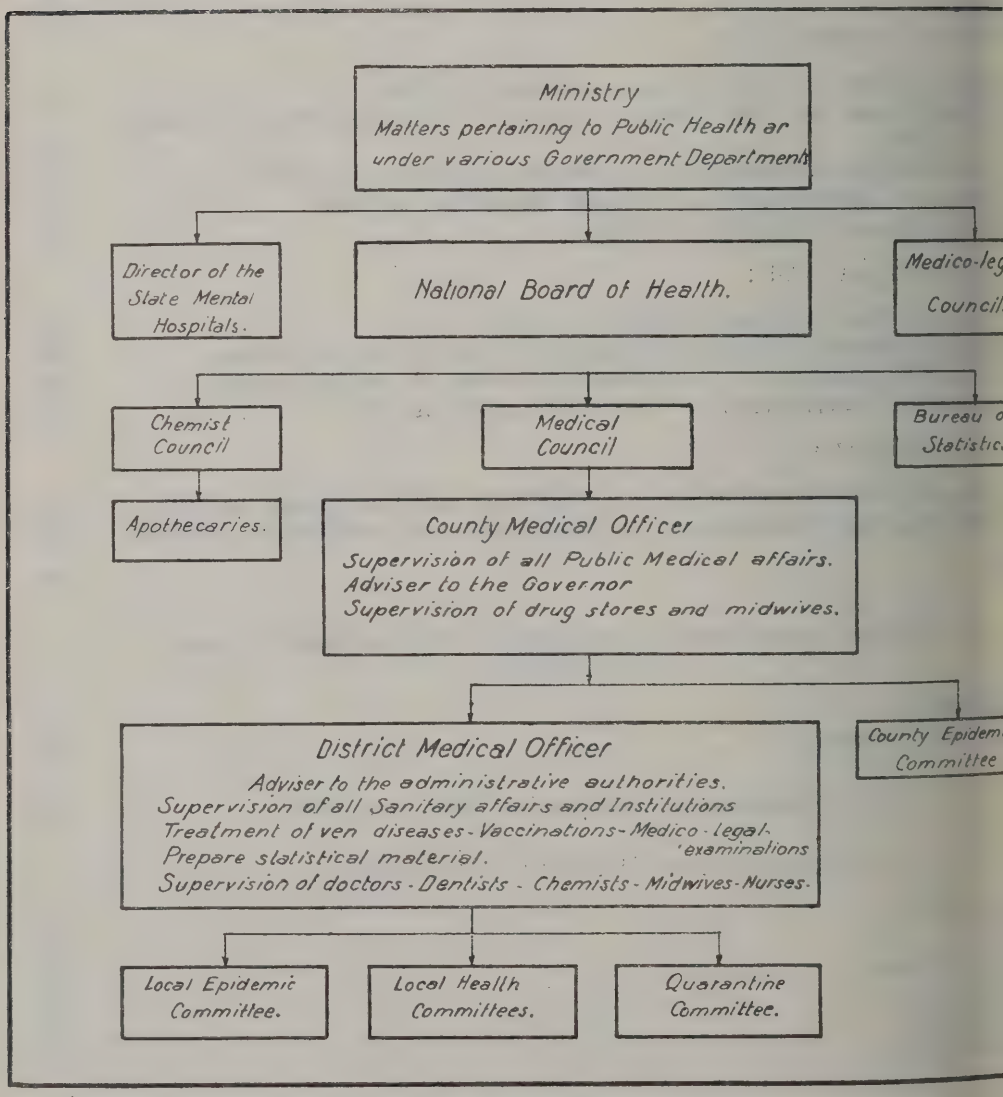
Public Health Organisation of Denmark



I. GENERAL INTRODUCTION.

7 square kilometers.

lion.

(estimated) 3,419,656,

Rates.

(a) DEATH RATES BY AGE-GROUPS AND SEX IN 1924 [1].

	Estimated population, July 1st, 1924		Deaths			
			Male		Female	
	Male	Female	Total	Per 1.000 inhabitants	Total	Per 1.000 inhabitants
ear ..	41,055	39,788	3,721	90.6	2,569	64.6
rs ..	68,974	67,467	683	9.9	537	8.0
..	68,974	67,467	216	3.1	179	2.7
..	175,720	172,991	257	1.5	195	1.1
..	175,720	172,991	221	1.3	213	1.2
..	160,939	162,612	416	2.6	422	2.6
..	141,232	152,232	421	3.0	488	3.2
..	236,483	259,487	714	3.0	894	3.4
..	201,996	216,239	855	4.2	1,062	4.9
..	152,728	164,342	1,217	8.0	1,498	9.1
..	113,314	128,013	2,114	18.7	2,269	17.7
..	72,258	84,766	3,421	47.4	3,809	44.9
..	29,560	36,328	3,458	117.0	3,910	107.6
id over	3,284	5,190	1,078	328.3	1,523	293.4
..	1,642,237	1,729,913	18,792	11.5	19,568	11.3

deaths which occurred in the Faroe Islands are included, but the population of the islands is excluded lation of Denmark as estimated on July 1st, 1924.

(b) DEATH RATES BY AGE-GOUPS, SEX AND PRINCIPAL CAUSES OF DEATH

Age	Diarrhœa and Enteritis				Influenza		
	Male		Female		Male		F
	Total	Per 1,000 inhab	Total	Per 1,000 inhab.	Total	Per 1,000 inhab.	Total
Under 1 year..	375	9.1	226	5.7	74	1.8	42
1– 2 years ..	29	0.4	24	0.4	20	0.3	6
3– 4 ,, ..	5	0.07	5	0.08	3	0.04	1
5– 9 ,, ..	3	0.02	2	0 01	5	0.03	2
10–14 ,, ..	2	0.01	2	0.01	5	0.03	2
15–19 ,, ..	1	0.006	—	—	11	0.07	11
20–24 ,, ..	1	0.007	2	0.01	10	0.07	7
25–34 ,, ..	2	0.008	1	0.004	14	0.06	12
35–44 ,, ..	1	0.005	1	0.005	22	0.1	27
45–54 ,, ..	3	0.02	1	0.006	27	0.2	28
55–64 ,, ..	3	0.03	9	0.07	39	0.3	36
65–74 ,, ..	7	0.1	8	0.09	42	0.6	66
75–84 ,, ..	10	0.3	11	0.3	36	1.2	63
85 yrs. and over	1	0.3	1	0.2	11	3.4	22
Total ..	443	0.3	293	0.2	319	0.2	325

Age	Tuberculosis				Cancer		
	Male		Female		Male		F
	Total	Per 1,000 inhab.	Total	Per 1,000 inhab.	Total	Per 1,000 inhab	Total
Under 1 year..	48	1.2	40	1.0	1	0.02	—
1– 2 years ..	85	1.2	69	1.0	6	0.09	3
3– 4 ,, ..	47	0.7	50	0.7	3	0.04	6
5– 9 ,, ..	65	0.4	61	0.4	3	0.02	4
10–14 ,, ..	63	0.4	88	0.5	4	0.02	—
15–19 ,, ..	169	1.1	263	1.6	13	0.08	7
20–24 ,, ..	186	1.3	283	1.9	15	0.1	10
25–34 ,, ..	280	1.2	361	1.4	30	0.1	69
35–44 ,, ..	188	0.9	225	1.0	96	0.5	182
45–54 ,, ..	153	1.0	151	0.9	227	1.5	383
55–64 ,, ..	121	1.1	130	1.0	527	4.7	596
65–74 ,, ..	100	1.4	107	1.3	772	10.7	736
75–84 ,, ..	22	0.7	31	0.9	405	13.7	481
85 yrs. and over	2	0.6	3	0.6	57	17.4	74
Total ..	1,529	0.9	1,862	1.1	2,159	1.3	2,551

	Broncho-pneumonia				Heart Diseases			
	Male		Female		Male		Female	
	Total	Per 1,000 inhab.	Total	Per 1,000 inhab.	Total	Per 1,000 inhab.	Total	Per 1,000 inhab.
year ..	933	22.7	697	17.5	7	0.2	6	0.2
ars ..	227	3.3	163	2.4	2	0.03	1	0.01
,, ..	16	0.2	19	0.3	1	0.01	—	—
,, ..	14	0.08	13	0.08	4	0.02	3	0.02
,, ..	3	0.02	5	0.03	8	0.05	13	0.08
,, ..	2	0.01	4	0.02	12	0.07	11	0.07
,, ..	8	0.06	7	0.05	13	0.09	13	0.09
,, ..	14	0.06	12	0.05	34	0.1	44	0.2
,, ..	13	0.06	27	0.1	69	0.3	91	0.4
,, ..	20	0.1	63	0.4	149	1.0	211	1.3
,, ..	51	0.5	113	0.9	373	3.3	383	3.0
,, ..	191	2.6	289	3.4	542	7.5	728	8.6
,, ..	231	7.8	297	8.2	374	12.7	554	15.2
nd over	70	21.3	85	16.1	42	12.8	95	18.0
l ..	1,793	1.1	1,794	1.0	1,630	1.0	2,153	1.2

(c) GEOGRAPHICAL DISTRIBUTION OF GENERAL MORTALITY IN 1924.

Districts	Estimated population July 1st, 1924	Deaths	
		Total	Per 1,000 inhabitants
gen and Frederiksberg	688,000	8,242	12.0
wns in the Islands	288,550	3,275	11.4
ns in Jutland	446,650	5,131	11.5
stricts in the Islands	846,300	9,650	11.4
istricts in Jutland	1,102,650	11,803	10.7
whole country	3,372,150	38,101	11.3

(d) SEASONAL DISTRIBUTION OF GENERAL MORTALITY IN 1924.

	All Deaths	Deaths per months of 30 days	Deaths per 1,000 inh calculated per month days and on annua
January	3,425	3,315	11.7
February	3,202	3,312	11.7
March	4,052	3,921	13.9
April	4,140	4,140	14.6
May	4,049	3,918	13.9
June	3,179	3,179	11.2
July	2,918	2,824	10.0
August	2,643	2,558	9.0
September	2,472	2,472	8.7
October	2,679	2,593	9.2
November	2,706	2,706	9.6
December	2,924	2,830	10.0
Totals	38,389	37,768	11.2

(e) PROPORTIONAL MORTALITY IN 1924.

INCLUDING THE FAROE ISLANDS

	Total	Deaths Per
Diseases of the respiratory organs	5,665	
Infirmity of age	4,965	
Cancer	4,711	
Diseases of the brain and the spinal cord	4,056	
Heart diseases	3,961	
Tuberculosis	3,391	
Epidemic diseases	2,701	
Congenital malformation	1,931	
Diseases of the digestive organs	1,243	
Diseases of the urinary and genital organs	1,228	
Cause of death not stated	945	
Violent deaths	799	
Constitutional diseases	762	
Various internal diseases	622	
External diseases	568	
Suicide	463	
Infantile debility	112	
Puerperal death	106	
Syphilis	91	
Alcoholism	69	
All deaths	38,389	1

Mortality in 1924.

(a) GENERAL RATE OF INFANT MORTALITY.

	Deaths under 1 year per 1,000 live births	Deaths 1-5 years per 1,000 live births
.. ..	84.9	10.6

) INFANT MORTALITY BY AGE GROUPS AND LEGITIMACY IN 1924 (EXCLUDING COPENHAGEN)

	Legitimate children		Illegitimate children		All children	
	Total	Per 1,000 live births	Total	Per 1,000 live births	Total	Per 1,000 live births
..	1,144	19.7	172	33.2	1,316	21.2
..	237	4.1	39	7.5	276	4.4
..	122	2.1	20	3.9	142	2.3
of the onth ..	173	3.0	22	4.3	195	3.1
th ..	1,676	28.9	253	48.9	1,929	31.0
..	395	6.8	71	13.7	466	7.5
..	465	8.0	100	19.3	565	9.1
..	383	6.6	61	11.8	444	7.2
..	303	5.2	49	9.4	352	5.7
..	245	4.2	28	5.4	273	4.4
..	257	4.4	30	5.8	287	4.6
..	201	3.4	17	3.3	218	3.5
..	221	3.8	31	6.0	252	4.1
..	201	3.5	30	5.8	231	3.7
..	159	2.7	25	4.8	184	3.0
..	179	3.1	24	4.6	203	3.3
r ..	4,685	80.6	719	138.8	5,404	87.1

(c) INFANT MORTALITY BY THE PRINCIPAL CAUSES OF DEATH IN 19
(INCLUDING THE FAROE ISLANDS).

	Number of deaths	Per 1,000 live births	Per 100 of all infant deaths
Congenital malformation	1,902	25.8	30.2
Broncho-pneumonia .	1,630	22.1	25.9
Cholerine	601	8.1	9.5
Convulsions	300	4.1	4.8
Whooping-cough ..	153	2.1	2.5
Measles	123	1.7	2.0
Infantile debility ..	104	1.4	1.7
Tuberculosis.. ..	88	1.2	1.4
Violent deaths ..	65	0.9	1.0
Congenital syphilis ..	45	0.6	0.7
Diphtheria	22	0.3	0.4
All other diseases ..	1,257	17.0	20.0
Totals	6,290	85.3	100.1

(d) SEASONAL DISTRIBUTION OF INFANT MORTALITY IN 1924
(EXCLUDING COPENHAGEN).

	Number of deaths in months of 30 days	Per 100 of all infant deaths	Per 1,000 live births[1]
January	453	8.5	87.5
February	479	9.0	92.5
March	584	11.0	112.8
April	738	13.9	142.5
May	719	13.5	139.9
June	422	7.9	81.5
July	345	6.5	66.6
August	266	5.0	51.4
September	287	5.4	55.4
October	328	6.2	63.3
November	334	6.3	64.5
December	364	6.9	70.3
The whole year..	5,319	100.1	85.6

[1] Calculated per month of 30 days and on annual basis.

Rates in 1924.

(a) GEOGRAPHICAL DISTRIBUTION OF LIVE BIRTHS AND LEGITIMACY IN 1924.

District	Live Births					
	Legitimate		Illegitimate		All Live Births	
	Total	Per 1,000 inhab.	Total	Per 1,000 inhab.	Total	Per 1,000 inhab.
ıgen and Frederiksberg..	9,837	14.3	2,404	3.5	12,241	17.8
er towns in the islands ..	5,284	18.3	557	1.9	5,841	20.2
ns in Jutland	9,803	21.9	1,275	2.9	11,078	24.8
stricts in the islands ..	16,165	19.1	1,542	1.8	17,707	20.9
i-tricts in Jutland ..	25,192	22.8	1,784	1.6	26,976	24.5
vhole country	66,281	19.7	7,562	2.2	73,843	21.9

GEOGRAPHICAL DISTRIBUTION OF STILL-BIRTHS AND LEGITIMACY IN 1924.

istrict	Still-births								
	Legitimate			Illegitimate			All Still-births		
	Total	Per 1,000 inh.	Per 1,000 Live Births	Total	Per 1,000 inh.	Per 1,000 Live Births	Total	Per 1,000 inh.	Per 1,000 Live Births
agen and eriksberg [1] ..	248	0.4	2.5	56	0.08	2.3	304	0.4	2.5
ıer towns in lands ..	130	0.5	2.5	16	0.06	2.9	146	0.5	2.5
wns in Jut-	190	0.4	1.9	30	0.07	2.4	220	0.5	2.0
istricts in the ls	411	0.5	2.5	71	0.08	4.6	482	0.6	3.1
listricts in nd	575	0.5	2.3	71	0.06	4.0	646	0.6	2.4
vholecountry	1,554	0.5	2.3	244	0.07	3.2	1,798	0.5	2.4

hould be remembered that many illegitimate children from the other towns as well as from the rural, f Denmark are born in the lying-in hospitals in Copenhagen and Aarhus (Jutland); consequently, the rates Copenhagen and Frederiksberg and for the towns in Jutland are too high, the other rates too low.

6. *Budget.*

On April 1st, 1925-26, the receipts and expenditure balance at 47 Danish crowns.

The headings presenting special interest are :

Ministry of Agriculture.

II. H. 1 and 2.—The Central Veterinary Authorities ..
6. *(a)* Tuberculin tests of cattle .. .. ..
(b) Compensation in case of tuberculosis of the udder .. ..
K. 3. The State meat control (Municipal meat control not included) .. ..

Ministry for Home Affairs.

V. A. 1. The National Board of Health .. .. ..
B. The medical officers of health .. .. ..
C. Grants to the campaign against tuberculosis .. ..
D. Grants to the campaign against infectious diseases ..
1. Grants provided for by the Act concerning infectious diseases .. 1,480,000
2. The State Institute for Vaccine .. 21,100
3. The State Serum Institute ... 345,475
E. Grants to " medical aid " and nurses, etc. (mostly to nursing and midwifery) .. ..
F. Various institutes for curative medicine .. ..
G. Miscellaneous .. ..

VI. C. Grants to the municipalities for old-age pensions .. 42

Ministry for Social Affairs.

V. A. Grants to the sick-benefit clubs 14
B. Workmen's compensation .. ..
D. Grants to the pension fund for invalids 5

X. A. Hospitals for mental diseases 5
B. The Lying-in Hospital in Jutland .. .. ..
C. The State Hospital at Sonderborg .. .. ..
D. Homes for Epileptics at Nyborg .. .. ..
E. Establishments for tuberculosis 3
F. The Finsen Photo-therapeutic Hospital .. ..

Ministry for Social Affairs (continued).

		Crowns
XI.	Grants to the invalids (army)	6,747,479
XIII.	A. Care of the deaf and dumb	845,770
	B. Care of the blind	657,079
	C. Care of the crippled	600,000
	D. Care of the feeble-minded	2,720,764
XIV.	Child welfare	4,156,798

Ministry of Justice.

II.	M. The Medico-Legal Council	26,680
	N. 10. Post-mortem examinations	3,500
	11. Quarantine..	28,880
	12. Inspection of food	30,000
	P. Grants to the Danish Red Cross	120,000

Ministry for Education.

III.	D. Pharmaceutists' School	142,014
	E. Dentists' School	131,547
VIII.	The "Rigshospital" (scientific institutions and the training of medical students and midwives are not included)	4,428,388

Ministry of the Army.

II.	D. For health questions	593,500

Ministry of the Navy.

II.	H. For health questions	236,640

ECENT DEVELOPMENTS IN HEALTH ADMINISTRATION AND LEGISLATION.

inistration.

ring 1925, some changes have occurred in the distribution of the medical under the various central authorities.
e distribution is now as follows :

Ministry of the Army and Navy.

Military health questions.

Ministry of Justice.

The activity of the Medico-Legal Council.
Cremation. Post-mortem examinations and legal autopsy.
Safeguarding against violent lunatics and mentally deficient.
Matters connected with the International Opium Convention.
Matters connected with the Danish Red Cross.
Inspection of food. Sale of milk and cream, etc.
Quarantine.
Licence for motor drivers.
Venereal diseases.

Ministry for Home Affairs.

Public health in general, including the National Board of Health.
Sanitary regulations. Approval of by-laws, regulations, etc., authorities respecting health service, hospitals, etc.
Control of epidemics (the Epidemic Acts).
Medical officers. Doctors. Dentists. Pharmaceutical chemist wives.
Housing.
Workmen's accident insurance.

Ministry of Social Affairs.

Hygiene of factories and workshops.
Approved sick-benefit clubs. Accident insurance. Invalidity i Regulations concerning prevention of accidents.
The Lying-in Hospital in Jutland. The State Hospital at So
Public aid for treatment of tuberculous persons. Tuberculosis and sanatoria. Finsen's Photo-therapeutic Hospital.
Military invalidity pensions.
Care of the feeble-minded, deaf-and-dum, blind and crippled.
Child welfare. Children's homes. Supervision of foster-childre
The State Mental Hospitals. Care of lunatics.

Ministry of Public Works.

Sanitary conditions concerning railways and air service.

Ministry of Agriculture.

Agricultural products.
Veterinary affairs.
Dairies. Slaughter-houses. Inland meat control. Regulations fo milk, cream, butter, margarine, etc., as far as importation and tion are concerned.

Ministry for Churches and Ecclesiastical Affairs.

Cemeteries.
Burial regulation.

Ministry of Education.

The State Hospital "Rigshospitalet".
Training of physicians, dentists, pharmaceutists, midwives.
School hygiene.

utes and Decrees.

Regulations of the Ministry of Social Affairs of January 26th, 1925, regarding ection of Children in Homes, etc., and the health control of these homes.

Act of April 1st, 1925, concerning Manufacture and Sale of Margarine.

Act of April 1st, 1925, concerning Exportation and Importation of Eggs.

Act of April 18th, 1925, concerning the Employment of Children and Young lays down, among other things, that young people under 14 years must not oyed in other industries than agriculture and horticulture, forestry, shipping d fishing, and that young people between 14 and 18 years must not—with eptions—be employed within the same industries between 6 p.m. and 6 a.m.

Regulations of the Ministry of Justice concerning new forms for the mid- otification of still-born children, who are defined as children born after the ek of pregnancy without having given any signs of life.

Sanitary By-laws.—New sanitary by-laws were approved for about 52 com- s, most of them small rural districts. (In Denmark, about 850 to 900 rural ities out of 1,289 have now sanitary by-laws.) In 39 communities the by-laws were enlarged by provisions regarding meat inspection.

III. INFECTIOUS DISEASES IN 1924 AND 1925[1].

	1924		1925	
	Cases	Deaths	Cases	Deaths
atheria	5,241	202	5,102	130
ephalitis lethargica	107	56	147	76
psing fever	0	0	—	0
hoid fever (including paratyphoid)	482	34	343	47
uenza	73,098	638	58,929	422
demic hiccoughs	572	2	795	1
bro-spinal meningitis	129	76	138	85
te poliomyelitis	152	32	115	23
let fever	3,084	31	2,752	21
hus	0	0	—	0
llpox	25	2	0	0

[1] ble showing the number of cases of notifiable diseases reported monthly in Denmark in 1925 is to be found *iological Intelligence* No. 10, page 122.

In 1924, 62,737 persons were vaccinated by the State or municipal inst
or the medical officers of health. Many were vaccinated by private
Vaccination is compulsory.

There were, in 1924, 3,131 beds (0.9 per 1,000 inhabitants) for the isol
epidemic cases.

IV. PREVENTIVE MEDICINE AND HYGIENE.

1. *Tuberculosis.*

There were 2,467 deaths from pulmonary tuberculosis in 1924.

DEATHS FROM TUBERCULOSIS PER 10,000 INHABITANTS IN 1924.

Year	Tuberculosis (all forms)			Pulmonary tuberculosis	
	Urban	Rural	Total	Urban	Rural
1924	11.0	9.2	9.8	8.4	6.5

INSTITUTIONS FOR TREATMENT AND ISOLATION OF PATIENTS SUFFERING F
TUBERCULOSIS, 1924.

	Number of institutions	Num of b
Sanatoria	14	1,9
Tuberculosis hospitals	34	9
Seaside hospitals	3	4
Seaside sanatoria	10	5
Invalids' and recreation homes	6	1

2. *Cancer.*

DEATHS FROM CANCER IN 1924.

Year	Copenhagen		Other towns		Rural		The whole
	Total	Per 10,000 inhab.	Total	Per 10,000 inhab.	Total	Per 10,000 inhab.	Total
1924	904	15.5	1,245	14.8	2,541	13.0	4,690

real Diseases.

REPORTED CASES OF VENEREAL DISEASES IN 1924.

Year	Gonorrhœa	Soft Chancre	Syphilis	Syphilis per 10,000 inhabitants
.. ..	11,050	306	2,212	75

holism.

nber of reported cases of delirium tremens (the whole country) : 61.

' Welfare.

:ording to the Act of March 28th, 1923, concerning Child Inspection, there . the end of 1924, 30,924 children under inspection in the whole country, of ,747 in Copenhagen.
the whole country there were, at the end of 1924, 317 children's homes, with eds.

'al Hygiene.

1924, there were in existence :

	Beds
State mental hospitals	5,761 (5,275 in 1923)
o mental hospitals in Copenhagen	
nicipal mental hospitals	343
ntal wards in general hospitals	338 (189 in 1923)

out 6,450 beds were therefore provided for mental cases, *i.e.*, about 1.9 per 1,000 ants.
: mentally deficient, in 1924, about 3,100 beds (3,000 in 1923) were provided, per 1,000.
r epileptics, 600 beds, or 0.2 per 1,000.

V. CURATIVE MEDICINE.

pitals.

MBER OF BEDS IN GENERAL AND FEVER HOSPITALS AT THE END OF 1924.

	Total	Epidemic diseases	Skin and venereal diseases	Mental cases	Tuberculosis
r of beds	14,932 (14,314 in 1923)	3,131	889	338	26

2. *Number of Physicians, Medical Students and other Sanitary Personnel.*

(a) Number of physicians.—The number of physicians in 1924 was about In 1925, 114 took their degree.

(b) Number of medical students.—The number of medical students on O 1st, 1925, was : 998.

(c) Number of midwives in 1924 : 1,178.

(d) Number of dentists in 1924 was about 650.

(e) Number of apothecaries in 1925 : 315.

VI. BIBLIOGRAPHY.

Statistik Aarbog (Annuaire statistique) 1925. Publié par le Départem Statistique, Copenhagen 1925.

Health Organisation in Denmark. League of Nations, C.H./E.P.S. 49

Dodsaarsagerne i Kongeriget Danmark (Causes des décès dans le royau Danemark) 1924. Le Bureau de la Statistique médicale de la Direction sup de la Santé de l'Etat de Danemark. Copenhagen 1925.

Medicinalberetning for den danske Stat for 1924. (Health Year-Bo Denmark 1924.) Copenhagen 1926.

Finanslov for Finansaaret fra 1. *April* 1925 *til* 31. *Marts* 1926. (The for the Danish State for the Fiscal Year April 1st, 1925, to March 31st, 1926.) hagen 1926.

Kongelig dansk Hof- og Statskalender for Kongeriget Danmark for Aare (Royal Danish Office List for the Kingdom of Denmark for the Year 1926.) hagen 1926.

Forlegnelse over autoriserede Læger, Tandlæger og Dyrlæger i Danmark 192 Tillæg 1925. (Catalogue of Physicians, Dentists and Veterinary Surgeons in De 1924, and Supplement 1925.) Copenhagen 1924 and 1925.

Den civile Medicinallovgivning i Kongeriget Danmark for 1925. (The Medical Legislation 1925.) Copenhagen.

April 1926.

ESTHONIA

BY

Dr. Alfred MÖTTUS

Director of the General Health Administration of Esthonia.

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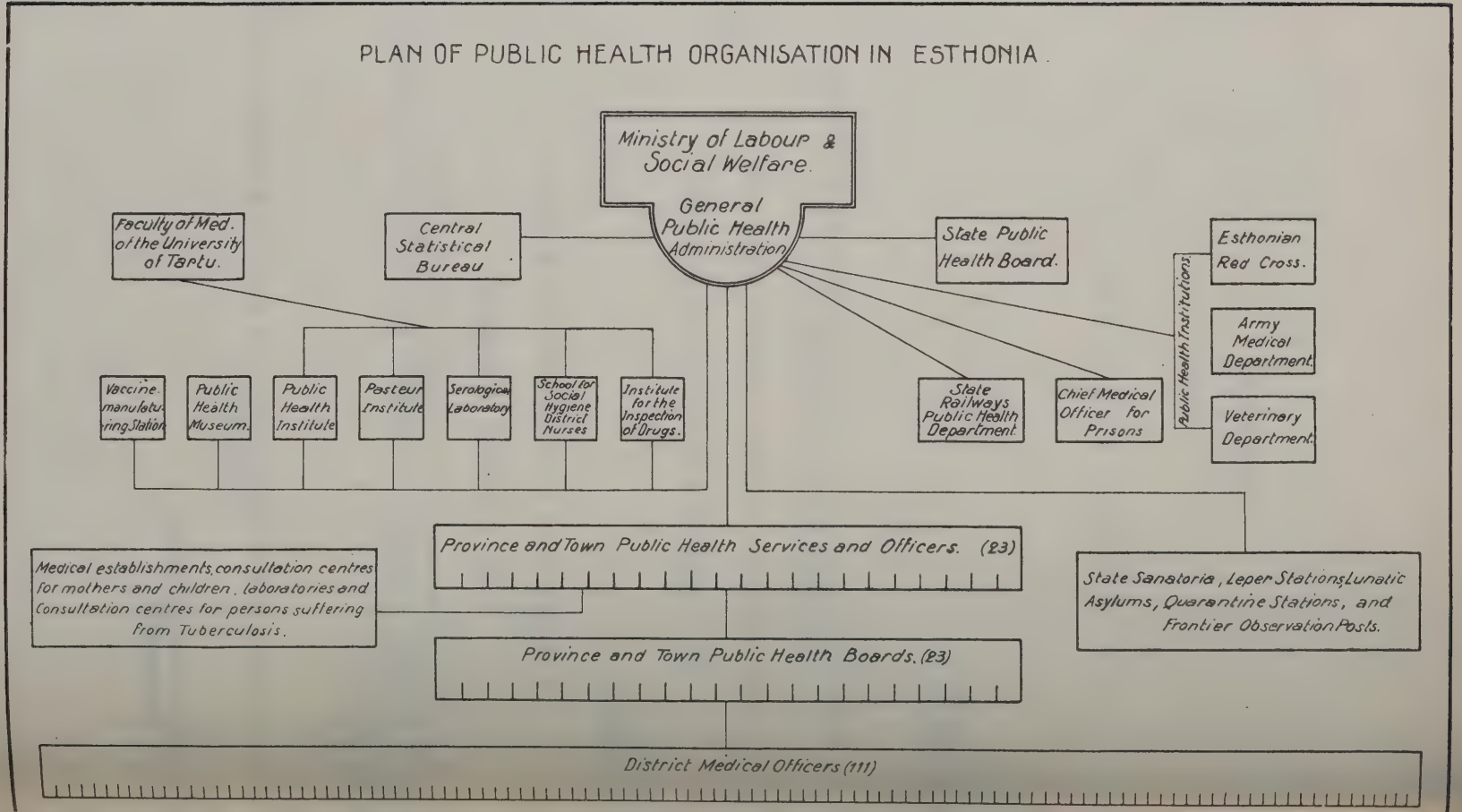
PLAN OF PUBLIC HEALTH ORGANISATION IN ESTHONIA.


Ministry of Labour & Social Welfare.
General Public Health Administration
Faculty of Med. of the University of Tartu.
Central Statistical Bureau
State Public Health Board.
Esthonian Red Cross.
Army Medical Department.
Veterinary Department.
Public Health Institutions
Vaccine manufacturing Station
Public Health Museum.
Public Health Institute
Pasteur Institute
Serological Laboratory
School for Social Hygiene District Nurses
Institute for the Inspection of Drugs.
State Railways Public Health Department.
Chief Medical Officer for Prisons
Province and Town Public Health Services and Officers. (23)
Medical establishments, consultation centres for mothers and children, laboratories and consultation centres for persons suffering from Tuberculosis.
State Sanatoria, Leper Stations, Lunatic Asylums, Quarantine Stations, and Frontier Observation Posts.
Province and Town Public Health Boards. (23)
District Medical Officers (111)

total area of the country is 47,538 square kilometers.

lation.

ording to the estimate of January 1st, 1925, the population of Esthonia was). In 1924, 6,731 marriages and 435 divorces were registered—*i.e.* 49.7 per thousand marriages.

Rate.

1924, there were 20,218 live births (10,379 males and 9,839 females). The of still-births was 502. Of the total number of births, 7.2 per cent were illegi- The birth rate was 18.50 per thousand. (See map for the births per pro- 1924.)

ral Death Rate.

total number of deaths in 1924 was 16,918 (8,993 males and 7,925 . The general death rate was therefore 15.3 per thousand. (See map for death province in 1924.)

NUMBER OF DEATHS IN EACH MONTH OF 1924.

January	1,625
February	1,490
March	1,539
April	1,464
May	1,444
June	1,136
July	1,126
August	1,136
September	1,163
October	1,248
November	1,238
December	1,317
Total	15,926

dates are available in respect of 992 deaths.

TABLE OF CAUSES OF DEATH IN ESTHONIA IN 1924.

Infectious diseases (inclusive of 2,180 due to tuberculosis)	
Diseases of the nervous system and sensory organs	
Diseases of the circulatory organs	
Diseases of the respiratory organs	
Diseases of the digestive organs	
Non-venereal diseases of the genito-urinary and adjacent organs	
Skin diseases	
Puerperal fever	
Bone diseases and diseases of the organs of locomotion	
Malformations	
Infantile debility	
Senile decay	
Diseases due to external causes	
General diseases not mentioned above (including 599 cases of cancer)	
Ill-defined causes	
Total	

The causes of death are unknown in 1,128 cases.

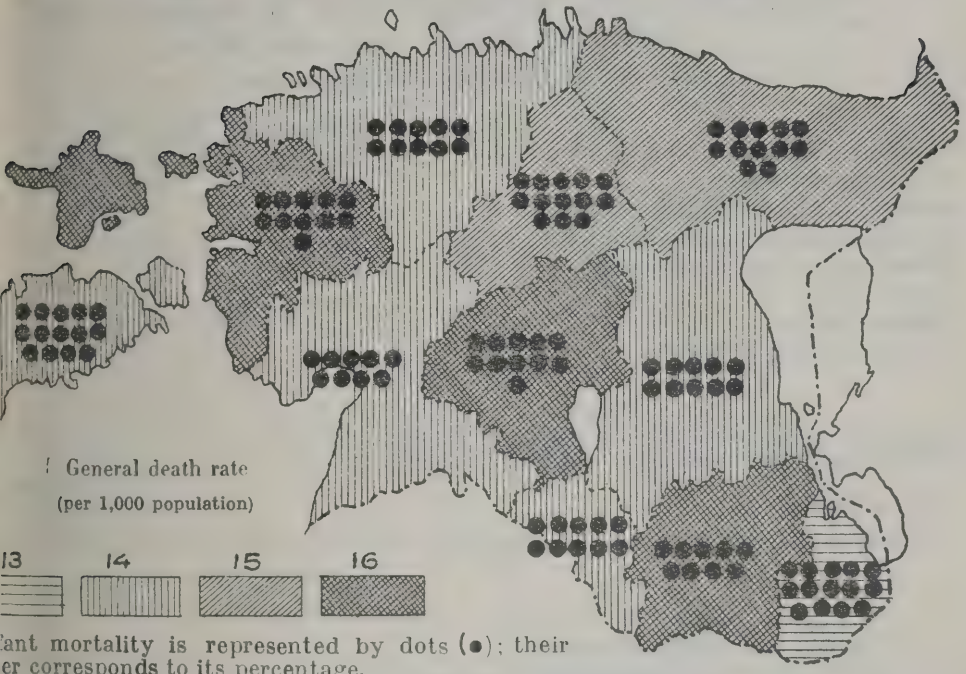
5. *Infant Mortality.*

In 1924, the total number of deaths of infants under one year of age w
(1,229 males and 913 females).

DEATH RATE FOR 1924 OF INFANTS UNDER ONE YEAR PER THOUSAND LIVE-BORN INFANTS.

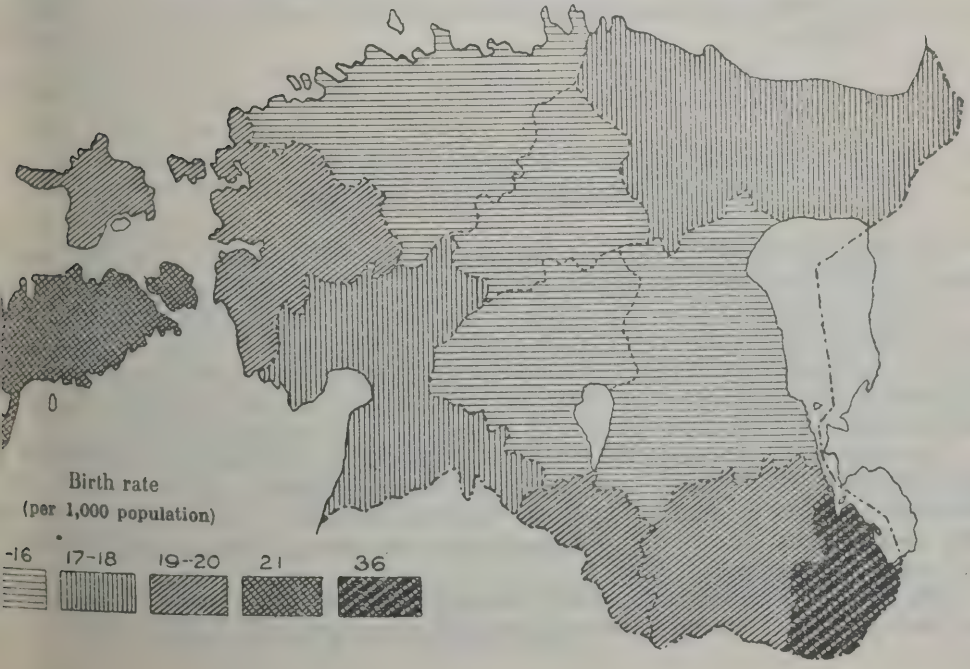
Age	Town	Province
Less than one day	6.5	6.6
One day	3.0	3.2
Two days	1.7	1.5
Three to seven days	4.7	7.3
One week	5.2	10.2
Two to four weeks	7.7	15.8
One month	6.7	12.1
Two months	6.0	8.3
Three to six months	19.8	24.0
Six to nine months	15.8	17.4
Nine to twelve months	9.3	9.1
Age unknown	0.5	0.5
Totals	86.9	116.0

DEATH RATE PER PROVINCE IN 1924



ant mortality is represented by dots (●); their
er corresponds to its percentage.

BIRTH RATE PER PROVINCE IN 1924



SCHEDULE OF CAUSES OF DEATH IN 1924 OF LEGITIMATE AND ILLEGITIMATE INFANTS UNDER ONE YEAR.

RATE PER THOUSAND BIRTHS.

	Legitimate.	Illegitimate.
Congenital debility and malformation	23.7	51.6
Infectious diseases	5.7	12.2
Diseases of the respiratory organs	9.4	11.5
Diseases of the digestive organs	16.7	34.4
Other diseases not mentioned	26.8	47.3
Convulsions	18.0	43.-
Violent deaths	0.2	4.3
No information available	1.1	2.9
Totals	101.6	207.2

6. *Budgets* (1925).

	Esthonian Mark
General budget	7,424,6000,0
Public health administration budget	63,346,8
Salaries	3,099,8
Travelling allowances	153,0
Doctors and medical supplies	306,4
Grants to health institutions	43,369,6
Grants for finishing courses for health officials	270,0
Medico-legal expert examinations	350,0
Public health	9,350,0
Construction and repair of buildings in leper colonies	6,430,0
Various	18,0
Total	63,346,8

II.

HEALTH LEGISLATION.

In 1925, Parliament ratified the law on health resorts. This law lays special preventive health measures for these stations and defines their field of w

The laws relating to medical death certificates and the notification of inf and venereal diseases have still to be ratified by Parliament. The former lays the rules relating to the issue of medical death certificates which are compuls the towns and certain country districts. The second completes the provisions a enacted regarding the notification of infectious and venereal diseases.

In addition to these laws, the Public Health Administration submitted Government in 1925 two Bills concerning the organisation of the health ser Esthonia and the campaign against venereal diseases. These Bills are at p being discussed by a Commission composed of members of the Government and laid before Parliament in 1926.

The Health Administration is at present engaged in the preparation of tw one dealing with infectious diseases and the other with the health staff.

conformity with a decision of the Health Council, the Health Administration
n 1925 further regulations on the internment of lepers in leper colonies. The
Administration, with the help of the Ministry of Finance, compiled in 1925
of foreign proprietary remedies the importation and sale of which will be per-
n Esthonia (Annex, § 113 of the Customs Tariff). It has, moreover, drawn
of sanitary appliances which all public pharmacies must keep in stock, and
d the amount of a new drug tax.

IT REFORMS IN HEALTH ADMINISTRATION AND LEGISLATION.

ORGANISATION OF THE PUBLIC HEALTH SERVICES.

A. *Direction of the Public Health Services.*

e direction and control of the public health and medical services are exer-
y the Ministry of Labour and Public Welfare through the Central Health
stration.

e Central Health Administration includes :

1. A general section ;
2. A pharmaceutical section.

e director of the Central Health Administration is a medical officer appointed
Government upon the nomination of the Minister of Labour and Public
.

e work of the Central Health Administration includes :

Instruction in the general rules of hygiene and other matters pertaining to public health.

Demographic and health statistics.

The organisation of enquiries into the health conditions of the country and their improvement.

The permanent and special preventive health organisations of the State and their control ; in particular, at the frontiers and on the lines of communication within the country.

The campaign against diseases in general and against infectious diseases in particular, disinfection, vaccination, establishment of serological and vaccinogene institutes, bacteriological laboratories, etc.

The treatment of the sick (first aid, transport of patients, public and private hospitals, medicinal waters, health resorts, sanatoria, etc.).

Campaign against venereal diseases and prostitution, sanitary control on the rivers and in the ports, of industrial and commercial undertakings, prisons, quarantine stations, schools, asylums, etc.

Eugenics : The protection of mothers and children and the campaign against infant mortality ; measures for improvement in the feeding of children and infants.

Campaign against alcohol and its consequences.

Supervision of public and private health institutions and co-ordination of their work.

Supervision of health insurance funds.

Supervision of food products and beverages ; sanitary supervi establishments for the manufacture, sale and storing of such produ

Supervision of dairies, of milk and dairy products.

Supervision of slaughter-houses.

Sanitary supervision of wells, rivers, lakes, water reservoirs and of water for human consumption.

Control of road cleaning (scavenging, conservancy, sewerage, ca tion and drainage works, etc.).

Health supervision of labour (accidents, professional diseases, regu concerning woman and child labour, etc.).

School hygiene.

Examination of plans for the construction or reconstruction of buildings and the issue of permits for opening them.

Registration of members of the medical and allied professions, a issue of authorisation to exercise these professions and control o professional work.

Supervision of institutions (schools, courses of instruction, etc.) technical training of the intermediate and subordinate health pe (dentists, sisters of charity, masseurs, nurses, samaritans, etc.). Ex tion and approval of their programmes of study and issue of the ne authorisation for opening such establishments.

Forensic medicine, attendance of medical officers at pension missions and military medical boards.

Issue of necessary permits for opening public (State or com and private hospitals and approval of plans for building or rebuildi establishments.

Pharmaceutical services.

Draft of regulations and tariffs for pharmacies.

Supervision of pharmacies, drug stores and drug factories, labor chemists' shops, perfumeries, and issue of the necessary permits for o such establishments.

Control of mineral waters, fruit beverages, and establishments these are prepared or stored and issue of permits for opening such est ments.

Issue of permits for sale of all sanitary appliances, medical and o preparations (table waters, medicinal waters, medicinal wines).

Control of the manufacture and sale of poisonous and in substances for industrial or other purposes.

National development of cultivation and preparation of medicinal plant

Control of pharmaceutical and medical advertisements (treatment, appliances).

Technical advanced training of health staff (courses of instruction, excu study tours, etc.).

Direct correspondence with central health institutions of foreign count connection with all questions within the competence of the Central Administration.

B. *State Health Council.*

The State Health Council is the supreme medical and sanitary authority country. All questions connected with public health and medicine and, in part expert forensic medical investigations, are within its competence.

e Director of the Central Health Administration is President of the Health . The members are :

The Director of the General Section of the Central Health Administration (Deputy President).

The Director of the Pharmaceutical Section of the Central Health Administration.

The Director of the Health Institute of the University of Tartu.

The Director of the Pharmaceutical Institute of the University of Tartu.

The Principal Medical Officer of the Army.

The President of the Red Cross.

The Director of the Veterinary Administration.

A Provincial Medical Officer (representing the Provincial Medical Officers).

A Municipal Medical Officer (representing the Municipal Medical Officers).

A District Medical Officer (representing the District Medical Officers).

The Principal Railway Medical Officer.

The Principal Prison Medical Officer.

A representative of the Association of Medical Societies.

The Medical Secretary of the Central Health Administration, who, at the same time, acts as Secretary of the Health Council.

ıe Health Council investigates all draft laws concerning public health and draft ions which concern the whole State before they are submitted to Parliament he Government. The Health Council has the right to suggest amendments ditions to the laws and regulations in force concerning public health ; it sub- hese amendments or additions through the Central Health Administration Minister of Labour and Public Welfare.

C. *Health Services of the Local Administrations.*

ıe duty of the above is to safeguard public health within the limits of their ts.

ıe duties of the Provincial and Municipal Administrations are as follows :

To establish hospitals, consultation-rooms, chemical and bacteriological laboratories, disinfection plants, and to supervise the operation of the above.

To control the manufacture, transport, sale, storing and consumption of food products and beverages.

To ensure a pure water supply for the population by the construction and maintenance of wells, reservoirs and water conduits and to ensure their sanitary condition.

To safeguard the purity of the atmosphere and the cleanliness of the grounds ; in particular, near factories and other industrial undertakings.

To organise the removal and destruction of refuse, garbage and waste water, and the suppression of foci of infection.

To ensure the sanitary condition of buildings by enforcing the observation of the regulations and rules relative to the sanitary condition of public and private buildings and dwellings and by ordering the repair or destruction of unsanitary buildings and dwellings.

To ensure the sanitary condition of industrial enterprises by gating and applying all measures necessary for their improvement.

To establish cemeteries, mortuary chapels and houses and cre and to control burials, exhumations, and the transport of bodies ac territory of the State according to the laws and rules in force.

To supervise the work of pharmacies, drug stores, drug manufa chemical and pharmaceutical laboratories, cosmetics factories, r water, fruit-beverages and lemonade factories, etc., in accordance with t and rules in force and the instructions of the Central Health Adminis

To take all necessary measures for the destruction of da animals and insects (mad dogs, rats, flies, lice).

D. *Provincial and Municipal Medical Officers.*

The duties of head of the health service in the provinces and towns are exerc the provincial and municipal medical officers nominated by the Provincial Co the Assembly of City Delegates and appointed by the Director of the Central Administration on the proposal of the district or municipal administrations.

The provincial and municipal medical officers supervise the practical an nical operation of the health services in their province. Their duties are as f

To safeguard the health of the population by supervising the app of preventive measures and the execution of the sanitary laws, regu rules and instructions in force.

To direct and control the work of the district medical officers by official correspondence on all matters concerning public health.

To investigate all circumstances which may influence the coeffi the death rate and morbidity in order to trace and endeavour to rem causes of infection.

To receive and register all notifications of infectious diseases, to compulsory notification in accordance with the laws and rules in and to forward a weekly return of notifications to the Central Administration.

To investigate the causes of outbreaks and of the spread of infe epidemic and endemic diseases within their areas ; in the case of an ou of epidemic disease to submit to the Central Health Administr programme of preventive measures for their areas.

To enforce the application of prophylactic measures (disinf disinsectisation, isolation), in accordance with the laws and regulat the Central Health Administration.

To keep a register of the health personnel (medical officers, ch dentists, midwives, sisters of charity, masseurs, etc.) working withi province and to supervise their professional work and that of the institutions.

To submit to the Central Health Administration an annual repo taining a summary of demographic and health statistics, a description health conditions of the population and an account of the working health services in their province, etc., in accordance with the instruct force.

To maintain close contact by correspondence and otherwis the Central Health Administration, carrying out its decisions and i

tions, reporting all plans for the improvement of health conditions and informing them of any difficulties and obstacles encountered in the exercise of their duties.

To request the judicial and administrative authorities to take proceedings against all persons who have committed offences against the laws, regulations and provisions in force concerning health.

To attend, with right to a vote, meetings of the military medical boards and pensions and other committees as laid down by law.

E. *District Medical Officers.*

e duties of the district medical officers are as follows :

To be responsible for the practical direction of all health work within their districts.

To safeguard health conditions in their districts by seeing that the health laws, regulations and provisions in force are carried out.

To investigate and determine within their districts the causes of epidemic and endemic diseases, to forward a report thereon to the provincial or municipal medical officer and suggest the measures to be taken against the spread of these diseases, to endeavour to suppress any centres of infection which may exist and improve the health condition of their districts.

To provide for the treatment of the sick in hospitals and similar establishments, to enforce the isolation of patients suffering from infectious diseases and of infected buildings or other places, and to apply the measures of disinfection and disinsectisation laid down by law.

To organise, if necessary, preventive measures against epidemic diseases within their districts and to give medical assistance free of charge to the population and in particular to the poor.

To supervise establishments where food products and beverages are manufactured, sold or stored, and to prevent adulteration.

To ensure the sanitary condition of public and private schools, hospitals, asylums and health institutions or scholastic or social insurance institutions and of all public premises and dwellings.

To ensure the removal of refuse, and waste water and to endeavour to prevent the formation of centres of infection through pollution of the water supply, of the atmosphere or of the soil.

To work in the closest contact with the provincial or municipal medical officer, to see that all the provisions and instructions of the latter are carried out and to bring to his notice all plans relative to the improvement of the health conditions of their districts and the removal of all obstacles and difficulties encountered in the exercise of their duties.

To forward to the provincial or municipal medical officer an annual report, with statistical returns for the year and an account of the health conditions of the district.

To direct and supervise the health personnel of the district and the work of the health institutions, to enforce notification of infectious diseases and to submit all reports required by law and by regulations of the Central Health Administration.

To inform the provincial or municipal medical officer of all offences against the health laws, rules and regulations.

F. *Communal Hospital, School and Poor-law Medical Officers, etc.*

The communal hospital, school and poor-law medical officers, the director communal health institutions and the whole personnel of the local health adm tions are appointed by the provincial or municipal administrations on the p of the provincial or municipal medical officer. These appointments are repo the Central Health Administration for registration.

The sphere of action of the school medical officers is determined by the pr or municipal administration, on the proposal of the Health Service.

Forensic medical officers and chemists are subject to special laws and ap by the Director of the Central Health Administration. Their salaries are paid State Treasury and charged to the budget of the Central Health Adminis Their sphere of activity is laid down by the Health Council of the State.

III. CAMPAIGN AGAINST INFECTIOUS DISEASES[1].

No important changes have been made in the methods of conducting the ca against infectious diseases since 1924. No case of plague, Asiatic cholera or was reported. Two cases of relapsing fever and twenty-one cases of typh notified ; all were imported from abroad. Five cases of smallpox occurred. has been a noticeable decrease in smallpox during the last few years. This dec due to the introduction of compulsory vaccination. Dysentery has also dec there were thirty-eight cases in 1925. In addition to other measures agai disease, anti-dysenteric serum was widely used. The morbidity of scarlet fe increased and that of measles decreased. This difference may be accounted the periodical fluctuation observed in these diseases. Since there is no further n for the quarantine station at Narva, on the eastern frontier, it has been supp an observation station, with medical staff and disinfection plant, however, re

IV. CAMPAIGN AGAINST SOCIAL DISEASES.

1. *Tuberculosis.*

In 1925, the following deaths from tuberculosis were notified :

Tuberculosis of the respiratory organs	1,359
Tuberculosis of the meninges or the central nervous system	24
Tuberculosis of the intestines and of the peritoneum	5
Tuberculosis of the vertebral column	6
Articular tuberculosis	20
Tuberculosis of the skin and cellular tissues	1
Tuberculosis of the bones	34
Tuberculosis of the lymphatic system	20
Tuberculosis of the genito-urinary organs	4
Tuberculosis of an unspecified nature	287
Total	1,760

[1] A table showing the number of cases of notifiable diseases reported in Esthonia in 1921-25 is to b *Epidemiological Intelligence*, No. 10, page 126.

1924, 2,180 deaths were registered as due to tuberculosis.
e most important measures taken against tuberculosis were the establishment ulances and anti-tubercular dispensaries. The State subsidises all city and ambulances. The city of Tallinn began in 1925, with State assistance, to build tion hospital with 100 beds for serious tuberculosis cases. The Anti-Tubercu-ague, to the foundation of which all classes of society contributed, has built a ium at Nomme, near Tallinn, with 40 beds; this number is gradually to be d.

ereal Diseases.

e notification of venereal diseases has been compulsory since April 1921 and is by means of anonymous registration cards. In 1925, 3,709 cases were notified nia, of which 2,420 occurred in Tallinn, and 1,289 in the other towns and in the , as shown in the table below :

	Syphilis	Soft chancre	Gonorrhœa	Total Number
. . . . .	502	28	1,890	2, 420
wns and country districts . . .	327	26	936	1,289
Totals.	829	54	2.826	3,709

nereal disease is gradually decreasing, as shown by the figures below :

	1922	1923	1924	1925
venereal diseases	4,645	4,354	3,871	3,709

e treatment is provided for cases of syphilis in the infectious stage, the treat-eing administered at State expense in the hospitals, ambulances and dispen-Three anti-venereal dispensaries provide treatment free of charge to all s, two at Tartu and one at Tallinn. Although these institutions have only been for a short time, their utility has already been amply demonstrated. As an e, the following figures will show the work carried out during 1925 in the Dispensary[1] :

r of cases ed	601, of which	439 males	333 unmarried, 92 married, 8 widowers, 6 divorced	2,773 visits
		162 females	82 unmarried, 66 married, 14 widows	1,507 visits
s	187 „	103 males, 84 females		
is, with rrhœa		2 males		
lications .	3 „	1 female		
nœa . . .	189 „	175 males, 14 females		
ancre . .	4 „	4 males		

[1] Population in 1922 was 122,419.

Non-venereal diseases of the genital organs .. ..
Skin and other diseases .. ..
Unspecified suspected cases .. ..
Healt hy cases... .. ..

In addition, most of the hospitals in the towns and rural districts posse venereal wards, under the direction of specialists, to which patients requiring l treatment are admitted.

Prostitution is regulated by special provisions. The registration of pro and their periodical inspection—at least once a week—is compulsory thro Esthonia. Brothels are prohibited. Prostitutes suffering from venereal disea sent to hospital. At Tallinn there is a special hospital for the treatment of v and skin diseases, principally for the use of prostitutes. This hospital has 10

In 1925, this hospital treated 249 cases of syphilis and 551 cases of gonorrh number of propaganda pamphlets have been circulated in order to draw the at of the public to the dangers of venereal disease.

V. PROTECTION OF CHILDREN AND MOTHERS.

At the homes for children and mothers (100 beds at Nomme, near Talli 50 beds at Tartu, Kuresaare and Narva) maintained by the State, 414 infan cared for in 1925 (375 infants in 1924 and 302 infants in 1923). The number o days in 1925 was 70,102, as against 55,266 in 1924. The average number of cared for per day in 1925 was 197.5 (150 in 1924).

The number to deaths in the homes was :

44 infants in 1924, or 11.7 % ;
57 infants in 1925, or 13.7 %.

The following numbers of illegitimate children were taken to the children's

1924 : 254 infants, or 63 %, of which 18, or 5 %, were abandoned by their mot
1925 : 328 infants, or 79 %, of which 23, or 6 %, were abandoned by their mot

In 1924, the mothers' homes received 111 mothers, of whom 105 (94.6 p were unmarried ; and in 1925 they received 170, of whom 146 (86 per cen unmarried.

These are classed as follows :

1924 : Domestic servants and factory workers, 98; daily workers, 9; other tions, 3.

1925 : Domestic servants and factory workers, 152 ; daily workers, 15 occupations, 3.

The following figures show the ages of the mothers received into the homes i

Under 20 years of age	29
21 to 25 years of age.	71
Over 25 years of age	70

e budget for the homes was as follows :

	Esthonian Marks.
1923	7,866,162
1924	10,593,028
1925	12,683,844

VI. GENERAL QUESTIONS.

itary Topographical Surveys and the Supply of Drinking Water.

e sanitary topographical surveys were continued in 1925 on the same lines as the preceding years. Up to the present, 288 out of 379 rural communes of the ic, 17 out of 19 boroughs, 11 summer resorts and all the towns have been d. 2,205 chemical analyses of water were made. Physical, chemical and ological analyses of the drinking water were made in all the railway stations. a are at present under examination with a view to their publication.

ching of Medicine; Number of Qualified Practitioners and Medical and armaceutical Students.

e number of professors of medicine at the University of Tartu did not change . There were 18 professors and 7 readers. During the second half-year term ere 440 medical students and 97 pharmaceutical students ; at the end of the e number of medical practitioners was 668.

1925, a three months' post-graduate course on various health subjects was ed at the University of Tartu for district and municipal medical officers.

lth Propaganda.

e Health Museum at Tartu should be considered as the centre of the propaganda ent. In 1925, its collections were visited by 12,260 people. 28 lectures were ith lantern slides and demonstrations, and 143 lectures were organised by this ion in various districts. The museum lent its preparations and collection of s, lantern slides, etc., to 74 societies. Its travelling exhibitions (three illustrat- protection of mothers and infants and two the anti-tuberculosis campaign) nt to tour the country districts and were of the greatest assistance in spreading propaganda. The museum organised a students' health exhibition during the s of School Doctors which took place in 1925.

cotic Drugs.

e importation of drugs in 1925 was as follows :

	Grammes
Opium	67,100
Morphium (Salt)	18,650
Heroin	950
Cocaine (Salt)	31,105

exportation has taken place.

VII. ESTABLISHMENTS FOR PRODUCTION AND SALE OF PHARMACEUTICAL PRODUCTS.

1. *Pharmaceutical Establishments.*

The following establishments came under the control of the Pharma Section of the Central Health Administration in 1925 :

Pharmacies	178
Laboratories	32
Mineral-water and lemonade factories	119
Drug stores	120
Branches of foreign firms	18
Total number of establishments	467

2. *Work of the Pharmacies.*

In 1925, the pharmacies made up 1,106,903 medical prescriptions, of a 108,546,786 Esthonian marks. Further, the sale of drugs without presc brought in a sum of 91,239,421 marks, giving a total of 199,786, 207 Esthonian The average price of a medicine made up according to a medical prescript 98 marks.

3. *Staff.*

In 1925, the pharmaceutical staff numbered 829, as follows :

Doctors in Pharmacy	2
1st-class pharmacists	34
2nd-class pharmacists	236
Assistant pharmacists	385
Student pharmacists	172
Total	829

The pharmacies employed :

1st-class pharmacists	16
2nd-class pharmacists	162
Assistant pharmacists	247
Student pharmacists	98
Total	523

The State Administration and pharmaceutical institutions employed thi class pharmacists, eight second-class pharmacists and five assistant pharmaci pharmacists who did not belong to the above two categories were employe University (professors, lecturers, assistants and students), in the laborato in the drug stores. A few of them pursued occupations outside their profess

May 1926.

FINLAND

BY

Dr. Herman LAVONIUS (Helsingfors)

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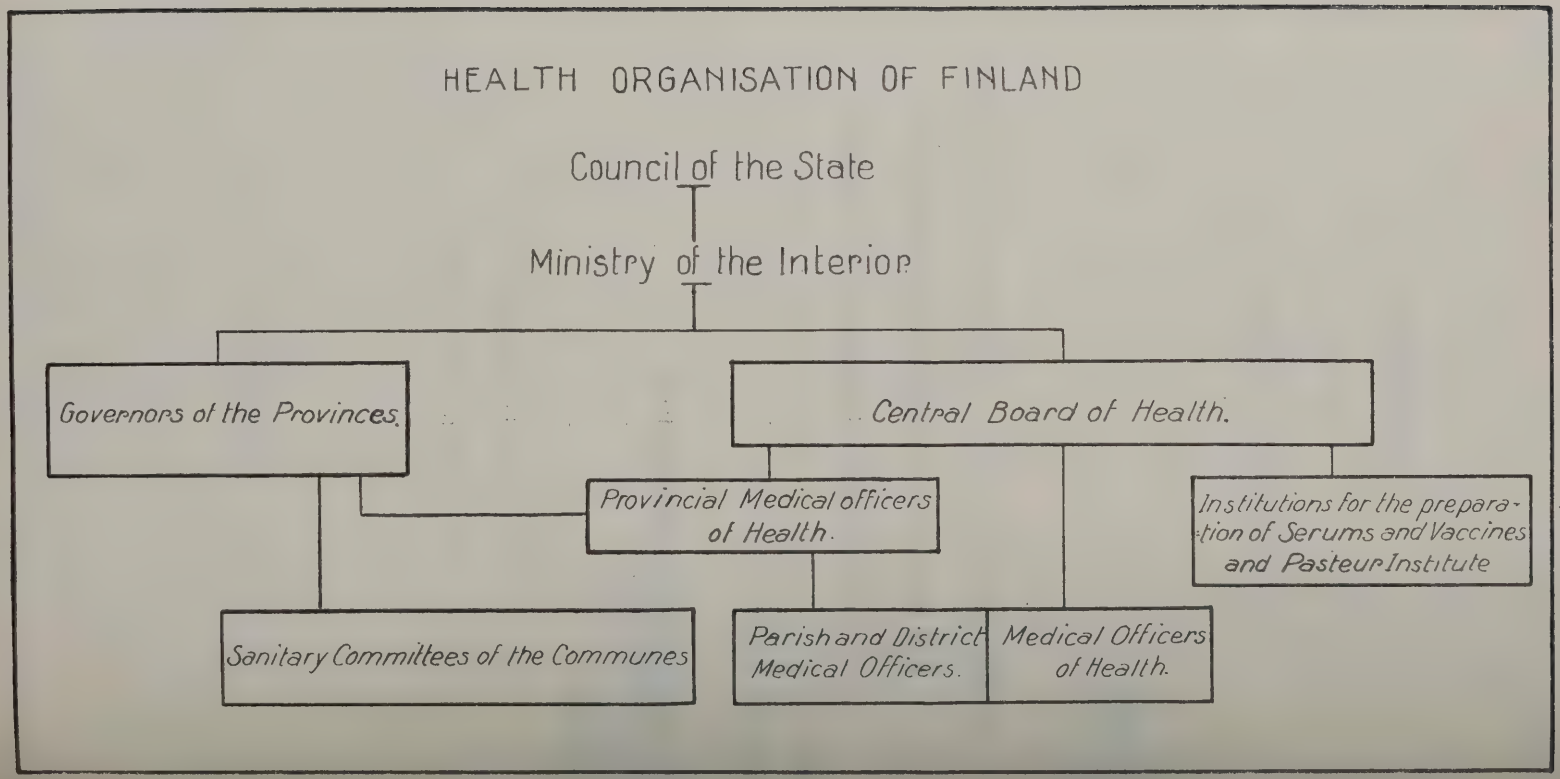
HEALTH ORGANISATION OF FINLAND
Council of the State
Ministry of the Interior
Governors of the Provinces.
Central Board of Health.
Provincial Medical officers of Health.
Institutions for the preparation of Serums and Vaccines and Pasteur Institute
Sanitary Committees of the Communes
Parish and District Medical Officers.
Medical Officers of Health.

I. GENERAL INTRODUCTION.

area of the country is 388,483 square kilometers, and, excluding surface 43,631 square kilometers.

ation.

population was, at the beginning of 1925, 3,495,186, of whom 1,726,570 were 1,768,616 females.

al Mortality.

total number of deaths in 1924 was 53,442 ; 27,682 were males and 25,760 Particulars concerning the deaths are given in the following two tables, their distribution according to sex, district and month.

DEATHS CLASSIFIED ACCORDING TO PROVINCES AND SEX IN 1924.

nce of	Towns			Rural Communes			Total		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
.. .. ..	1,264	1,312	2,576	1,760	1,591	3,351	3,024	2,903	5,927
l Pori ..	562	590	1,152	3,226	2,908	6,134	3,788	3,498	7,286
naa	10	5	15	163	170	333	173	175	348
.. .. ..	411	437	848	2,437	2,204	4,641	2,848	2,641	5,489
.. .. ..	504	434	938	4,363	3,709	8,072	4,867	4,143	9,010
.. .. ..	82	91	173	1,664	1,539	3,203	1,746	1,630	3,376
.. .. ..	247	205	452	3,056	2,745	5,801	3,303	2,950	6,253
.. .. ..	346	366	712	4,102	4,100	8,202	4,448	4,466	8,914
.. .. ..	256	296	552	3,229	3,058	6,287	3,485	3,354	6,839
.. .. ..	3,682	3,736	7,418	24,000	22,024	46,024	27,682	25,760	53,442

SEASONAL DISTRIBUTION DEATHS IN 1924.

	Towns	Rural Communes	Total
.. ..	1,007	6,707	7,714
.. ..	673	4,688	5,361
.. ..	626	4,323	4,949
.. ..	597	3,730	4,327
.. ..	618	3,833	4,451
.. ..	583	3,546	4,129
.. ..	607	3,425	4,032
.. ..	559	3,139	3,698
er	503	2,839	3,342
.. ..	545	2,946	3,491
er	533	3,260	3,793
r	567	3,588	4,155

4. *Infant Mortality.*

As shown by the number of children below one year of age who died in 19 infant mortality was 8,348, of whom 4,721 were males and 3,627 females ; the n of children below four years of age, including the infants mentioned above, who 1924 was 12,253, of whom 6,811 were males and 5,442 females. The distribu infant mortality among legitimate and illegitimate children will be seen fr following table :

MORTALITY OF LEGITIMATE AND ILLEGITIMATE CHILDREN OF ONE YEAR OF AGE AND UNDER, IN 1924.

	Towns	Rural Communes	Whole Country	
	Number	Number	Number	Per
Legitimate	698	6,551	7,249	8
Illegitimate	178	921	1,099	1
	876	7,472	8,348	1

5. *Birth Rate.*

The number and ratio of births will be seen from the following tables :

NUMBER AND PERCENTAGE OF LEGITIMATE AND ILLEGITIMATE CHILDRE BORN ALIVE IN 1924, CLASSIFIED ACCORDING TO PROVINCE.

Province of	Legitimate			Illegitimate			Total			Legiti mate
	Towns	Rural Com- munes	Total	Towns	Rural Com- munes	Total	Towns	Rural Com- munes	Total	Per cent
Uusimaa	2,677	4,385	7,062	277	557	834	2,954	4,942	7,896	89.4
Turku and Pori	1,146	8,264	9,410	167	1,089	1,256	1,313	9,353	10,666	88.2
Ahvenanmaa ..	11	339	350	2	22	24	13	361	374	93.6
Häme	934	6,197	7,131	162	943	1,105	1,096	7,140	8,236	86.6
Viipuri	1,098	11,564	12,662	126	828	954	1,224	12,392	13,616	93.0
Mikkeli	203	4,314	4,517	15	390	405	218	4,704	4,922	91.8
Kuopio	587	8,082	8,669	45	552	597	632	8,634	9,266	93.6
Vaasa	742	10,665	11,407	87	709	796	829	11,374	12,203	93.5
Oulu	698	9,375	10,073	89	716	805	787	10,091	10,878	92.6
Total ..	8,096	63,185	71,281	970	5,806	6,776	9,066	68,991	78,057	91.3

NUMBER OF LEGITIMATE AND ILLEGITIMATE CHILDREN BORN ALIVE AND STILL-BORN IN 1924.

	Born alive		Still-born		Total	
	Legitimate	Illegitimate	Legitimate	Illegitimate	Legitimate	Illegitimate
.. ..	8,096	970	207	52	8,303	1,022
ommunes	63,185	5,806	1,573	269	64,758	6,075
Total ..	71,281	6,776	1,780	321	73,061	7,097

ong the legitimate births, 97.6 per cent were born alive and 2.4 per cent were rn. Among the illegitimate births, 95.5 per cent were born alive and 4.5 per re still-born.

get.

e Budget of the State has been based on the same principles as in the previous The ordinary revenue was estimated at 3,131 million Finnish marks and the dinary revenue at 0.5 million marks. The ordinary expenditure was estimated 5 million marks and the extraordinary expenditure at 625 million marks. lly speaking, the expenditure shows an increase which has been most tangible eleventh class, representing the expenditure of the Ministry of Agriculture, the twelfth class, representing the expenditure of the Ministry of Communica- nd Public Works.

ie ordinary expenditure of the Sanitary Administration has increased by about on marks. The most important items in this increase were the grants in aid l communes for the payment of midwives and visiting nurses, which increased million marks, while the credit for the prevention of tuberculosis increased by on marks. The credit granted for the organisation of the instruction of n's welfare, amounting to 500,000 Finnish marks, was transferred from the rdinary budget to the ordinary one.

ie principal changes in the extraordinary budget were as follows : 2 million marks ranted for the foundation of a new hospital containing 150 sick-beds in the ce of Vaasa ; 4 million marks were granted for the commencement of the construc- a new State hospital for tuberculosis ; 21 million marks were granted in aid district lunatic asylums ; and 1 million marks were granted for the foundation nstitution for acute cases of insanity in the province of Oulu. The total expen- reserved for the Sanitary Administration amounted to 107,553,500 marks, amount exceeds the corresponding total for the previous year by 18,652,100

ie credits reserved for the expenditure of the veterinary service increased from evious year by 381,000 marks.

ie credits reserved for the protection of children, which previously were included tenth class, representing the expenditure of the Ministry of Education, were rred in 1925 to the fourteenth class, representing the expenditure of the Ministry cial Affairs, and were increased by approximately 4 million marks, the total the credits in question amounting, in 1925, to 16,781,900 marks. The Budget Ministry for Social Affairs included also a credit of 1,550,000 marks for the se of encouraging temperance work.

II. RECENT LEGISLATION CONCERNING PUBLIC HEALTH.

The most important Acts and Orders in Council relating to public health e in 1925 are the following :

Act concerning the Exercise of the Medical Profession, which superseded the concerning the medical profession of 1890.

According to the new Act, the following persons are entitled to exerci medical profession :

(a) Finnish citizens who have passed the examination of *Licei Medicinæ* at the State University and who have been declared "lega doctors ;

(b) Foreign citizens who have passed the examination of *Licei Medicinæ* in the State University of Finland and who have obtain authorisation ;

(c) Finnish citizens who have passed the examination of *Can Medicinæ* and who have been empowered by the Central Board of H or by another authority with the consent of the Central Board of H to act temporarily as doctors ;

(d) Any person who had obtained the authorisation to exerci medical profession before the enforcement of the Act in question ;

(e) Any person who, having passed a medical examination in a country, has there obtained unreserved authorisation to exercise the m profession and has been duly authorised in Finland after having his competence by the certificate issued by the Medical Faculty University of Helsinki (Helsingfors).

In the last-named case, authorisation is granted only when special reasons it desirable and only for a given period, to a given extent and under given con determined by the Central Board of Health. In certain cases specified in the A Central Board of Health is empowered to abrogate the authorisation to exerc medical profession for a given period, temporarily, and even permanently. legalised doctors are entitled to enter the State, municipal or communal servi similarly only a legalised doctor may be engaged by private persons, associ private hospitals and analogous institutions.

Act and Order concerning the liability for injury caused in motor-car traffic.

According to the Act, the proprietor and conductor of a motor-car are lia certain cases specified in the Act, among other things, to pay compensation for injury or death caused by them, as well as to contract insurance in an ap insurance institution in order to ensure the payment of life annuities for whic may be declared responsible.

Act amending the Act concerning the prevention of cattle diseases and Ord cerning the application of the said Act.

These enactments prescribe that the State shall be responsible for the expe caused by measures taken for the prevention of foot-and-mouth disease and plague. According to previous prescriptions, the expenditure caused by the p tion of contagious cattle diseases was to be apportioned between the State, com and private persons according to rules specified in the Act.

er concerning the importation of certain goods.

Order provides that, with a view to protecting the country against foot-and-isease, the importation of ground and unground corn, grain, vegetables, fruits ler shall temporarily be subject to the permission of the Ministry of the The same prescription applies to the importation of sacks and other cloth s unless they have been disinfected. Supplementary instructions concerning er have been issued in a decision of the Ministry of the Interior.

concerning the duties of veterinary surgeons in certain exceptional circumstances, er concerning the application of the said Act.

irtue of the Act, any veterinary surgeon or candidate of veterinary science e age of 50 years is obliged, in the event of the country being threatened ed by foot-and-mouth disease or any other particularly dangerous cattle , to assist the veterinary services in return for an appropriate remuneration.

er concerning the right of workers employed by the State to pensions.

ording to the Act concerning the right of State employees to pensions enacted workers employed by the State are entitled to a pension determined on the the relevant clauses of the Act. Detailed provisions to this effect are given bove-mentioned Order, in virtue of which the right to pension is subject to wing conditions ; first, that the worker has attained the age of 63 years, or as become, before attaining this age, incapable of remaining in the permanent f the State on account of bodily injury or physical or mental disability ; and, , that he has drawn his principal income from the permanent work of the ring at least ten years preceding his resignation.

ustrial Accident Insurance Act.

s Act, which entered into operation on January 1st, 1926, amends and extends me of compulsory insurance against industrial accidents, and covers all persons ing manual work in the employment of another person. In virtue of the tain occupational diseases caused by the preparation or manipulation of s specified in a schedule to be drawn up by the Council of the State are assimi- industrial accidents as regards compensation.

ler concerning contributions in the civil hospitals of the State.

irtue of this Order, contributions to be paid for treatment in the civil hospitals tate were increased as from January 1st, 1926, by about 25 per cent.

ision of the Ministry of Trade and Industry concerning the principles to be in the inspection of the crew in respect of their capacity for service on board ship.

ler amending certain articles of the Order concerning the inspection of the crew nd after engagement on board ship.

e following International Conventions concerning sanitary or medical matters en concluded or ratified or have given rise to other legislative measures in the f the year 1925 :

ler ratifying the International Convention relating to the foundation of an Inter- Bureau for the Study of Cattle Diseases in Paris.

ler ratifying the International Convention fixing the minimum age for admission en to employment at sea.

Order ratifying the International Convention concerning the compulsory m examination of children and young persons employed at sea.

Order ratifying the International Convention fixing the minimum age for the a sion of young persons to employment as trimmers and stokers.

Order ratifying the Commercial Treaty concluded between Finland and Spa

Order ratifying the International Convention relating to the prevention of the gling of alcoholic goods.

This International Convention was concluded between the Governmen Germany, Denmark, Esthonia, Finland, Latvia, Lithuania, Norway, Poland, Fre of Danzig, Sweden and the Union of Socialist Soviet Republics, and was ratified course of the year 1925 by the Governments of Finland, Norway and Sweden.

Act and Order ratifying and enforcing the Commercial and Maritime Treaty con between Finland and Italy.

Act concerning the enforcement of certain clauses of the temporary Comm Treaty concluded between Finland and the United States of America.

Act and Order concerning the ratification and enforcement in Finland of the Co cial and Maritime Treaty concluded between Finland and Latvia.

Order ratifying the Convention concluded between Finland and the Union of So Soviet Republics relating to the organisation of direct railway communication for pas and goods traffic.

III. EPIDEMICS AND CONTAGIOUS DISEASES.

As in the previous year, epidemics and contagious diseases were compara rare in Finland during the year 1925. It is particularly to be noted that the nu of cases of influenza was not more than one-fourth of the corresponding nu recorded in the previous year.

The spread of epidemics and contagious diseases in 1925 will be seen fro following list :

Variola	2
Typhus recurrens	—
Typhus exanthematicus	1
Typhus abdominalis	891
Paratyphus	664
Dysenteria	175
Scarlatina	1,697
Diphtheria	1,237
Polyomyelitis anterior acuta	28
Encephalitis lethargica	31
Influenza	19,004

IV. PREVENTIVE MEDICINE AND HYGIENE.

1. *Tuberculosis.*

As pointed out in the introductory section, the credit included in the 1925 b for the purpose of combating tuberculosis amounted to 10 million marks, wh 2 millions more than in the preceding year. In addition to this amount, the

credit of 4 million marks for the foundation of a sanatorium containing in South Ostrobotnia, the part of the country most affected by tuberculosis. ne year 1925, a new sanatorium containing 150 beds was inaugurated. This m has been founded on the initiative of a corporation of students and is the of a private company, but has been erected mainly by means of grants from ; the cost of its maintenance is met partly by the State and partly by the in which it is situated.

.

Diet granted 500,000 marks with a view to buying radium for the public of Helsinki.

eal Disease.

ereal disease increased to a certain extent in 1925. The number of cases will be seen from the following :

Syphilis recens	1,494
Urethritis gonorrh	9,017
Ulcus molle	1,490

scheme of combating venereal diseases elaborated in 1924 has not yet given ny measures.

ia.

s of malaria continued to be very rare in Finland. Not more than 28 cases rded in the course of the year.

oma.

udy entitled " The Incidence of Trachoma formerly and at present " was l in 1925 in the review *Acta Ophthalmologica*, in Copenhagen, by Dr. olm, Professor of Ophthalmology at the University of Helsinki. The principal the study is that the incidence of trachoma has decreased to a considerable nce 1908, the year in which the previous enquiry was conducted. While the ge of the total population represented by the number of persons affected oma in 1908 was 1.75, it was not more than 0.75 in 1924. A comparison of ence of trachoma in 1908 and 1924 is given in the following table :

THE INCIDENCE OF TRACHOMA IN FINLAND IN 1908 AND 1924.

(As a percentage.)

Place of examination	Number of Persons examined		Percentage of trachoma	
	1908	1924	1908	1924
.. ..	6,724	13,585	3.4	1.6
s	3,634	4,625	6.9	1.9
.. ..	2,735	2,402	4.9	1.3
uses	388	430	18.8	21.9

6. *Alcoholism and Abuse of Dangerous Drugs.*

Notwithstanding a stringent system of prohibition, the injurious influe alcoholism is felt to a considerable degree. The number of cases of drunk rendering legal proceedings necessary was, in 1925, not less than 70,305, of 68,317, or 97.2 per cent, were charged against men and 1,988, or 2.8 per cent, a women. As the corresponding total was, in the previous year, 63,405, the ir in 1925 was 6,900, or 10.9 per cent. The ratio of the misdemeanours in quest 10,000 of total population was, in the towns, 842, and in rural communes, no than 79, *i.e.*, only one-eleventh of the ratio of towns. This marked difference is due to the greater efficiency of the police supervision in towns. It is, however noted that the relation of the city and rural ratios of drunkenness was in the pr year 1 : 13, which would seem to indicate that the alcoholic indulgence tends to in in the rural districts. A classification, according to age, of persons found gu drunkenness gives the following result :

	Per cent
Below 20 years of age	7.9
From 20 to 29 years of age	43.1
From 30 to 39 years of age	26.0
From 40 to 59 years of age	20.9
60 years of age or over	2.1
Total	100.0

In view of the fact that the principal cause of the increasing alcoholism smuggling of alcoholic liquors from abroad, and in order to facilitate the efforts public authorities in the prevention of smuggling, the Diet passed in 1925 a concerning fast-going motor-boats. In virtue of this Act, a motor-boat c of 12 knots or more an hour can be procured only with the due authorisation governor of the province and must be driven by a duly approved conductor.

The use of dangerous drugs is very rare in the country. A tendency to increase, however, is noticeable. An attempt to smuggle, and sell illegally, c was discovered in 1925.

7. *Maternity and Child Welfare.*

The activity in the field of the protection of maternity, children and persons, including school hygiene and physical education, has continued on the lines as before. Several courses for school nurses have been organised, as preceding year, and the demand for them has increased considerably in the dif parts of the country.

8. *Mental Hygiene.*

A national conference for the care and education of mentally deficient p was held in 1925 under the auspices of the Child Welfare Section of the Minist Social Affairs. The conference elaborated a plan for future activities in this and decided to submit to the Government a petition to the effect that an c committee of experts be appointed with a view to preparing a Bill concerning ste tion. The Committee did not, however, commence its work in 1925.

dical Education.

he Faculty of Medicine of the University of Helsinki was provided with a new of Surgery.

ew instructions were issued in regard to the competence required from the l assistant in the Institute of Hygiene of the same university.

he posts of amanuenses attached to the Institutes of Serology and of Physiology converted into posts of assistants, so that the salaries of the occupants of these ncreased. At the same time, it was prescribed that the assistant in the Institute ysiology must pass the examination for *Candidatus Philosophiæ*, and obtain the t distinction in chemistry.

he Order concerning the office of the extraordinary professor of ear, nose and diseases, enacted in 1903, was amended to the effect that this branch of medical e should be included as an independent branch of study in the course of medicine a special subject in the examination of the *Licenciatus Medicinæ*.

V. CURATIVE MEDICINE.

unatic Asylums.

ncreased attention has been devoted to the care of the insane. As pointed out the Budget of the State included a credit amounting to 21 million marks in to provide communes with loans and grants for the purpose of constructing t lunatic asylums. In 1925, six asylums, which will contain 885 sick-beds in re under construction, and two of these, containing 300 beds, were finished and nt into use.

here are at present in Finland 13 district lunatic asylums, in use or under uction, which are mainly designed for the treatment of chronic cases of insanity. ntioned above, the Budget of 1925 included a credit of 1 million marks for the se of constructing in the city of Oulu a modern asylum for acute cases of insanity ing in the northern districts of the country.

new post of assistant physician was created in the department of ophthalmology public hospital of Helsinki. A new post of third assistant physician was founded sanatorium for tuberculosis at Halila.

VI. GENERAL PROBLEMS.

As regards the State control of foodstuffs, drugs and biological and serological cts, no changes have been made in the course of the year 1925.

Similarly, the Government policy respecting housing, water supply and drain ntinued in 1925 on previous lines.

June 1926.

FRANCE

BY

Dr. GUILHAUD (Paris)

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4. Occupational Hygiene . . . . . .

I. GENERAL INTRODUCTION.

ea.

e area of France proper is 550,986 square kilometers.

pulation.

e population of France is 39,209,158.

vement of the Population [1].

TABLE SHOWING MOVEMENT OF THE POPULATION, 1913-1925.

Millions of inhabitants	Marriages	Divorces	Children registered as live-born	Deaths		Excess of Births over Deaths	Proportion per 10,000 inhabitants		
				Total	Under one year		Marriages	Children registered as live-born	Total deaths
39.2	353,167	20,002	768,983	708,919	68,367	60,064	180	196	181
39.2	355,920	21,039	752,307	680,027	64,280	72,216	182	192	173
39.2	356,501	23,599	761,861	666,990	73,283	94,871	182	194	170
39.2	383,220	27,684	759,846	689,267	64,889	70,579	195	194	176
39.2	456,221	32,557	813,396	696,373	93,705	117,023	233	207	177
39.2	623,869	29,156	834,411	674,621	82,415	159,790	318	213	172
41.5	312,036	15,372	790,355	731,441	90,154	58,914	151	191	176

e results show a marked increase of live births (about 17,000 units as compared e preceding year 1924), but also a considerable increase in the number of deaths 29,000 more), so that the excess of births over deaths is reduced from 72,000 to 60,000, in round figures, in 1925.

th Rate.

Live Births.—As in all countries which took part in the war, there was a crease in the birth rate in France about 1920; the proportion of children regis- live-born per 10,000 inhabitants then rose to 213 (as compared with 191 in ne last year before the war). After 1920, there was a rapid decrease, not as , however, in France as in certain other countries, which explains why the French birth rate, although still low and about the same as for 1913, is not est in the comparative scale of international rates.

stated above, the year 1925 showed an increase of about 17,000 live births pared with 1924. It should be pointed out, moreover, that this increase in the

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[1] ance official vital and health statistics are issued by two separate departments: vital statistics by the Genera Office (Ministry of Labour, Health, Public Assistance and Social Welfare), health statistics by the Departmen elief and Health (at the same Ministry).

tatistics for the most recent period are only available in general reports published each year in the *Official Jour-* t of which, for the year 1925, has recently appeared (Annex to the *Official Journal* of April 10th, 1926). The tistical Office also issues a more detailed publication, *Statistics of the Movement of the Population*, but the last l. III, 1922) which appeared referred to the years 1914 to 1919, and the information contained therein, although fers to a period already remote and abnormal, as it covers the war period. The last official statistics concer- refer to the year 1921 (*Health Statistics in France for the Year* 1921, published in 1925). The figures showing ion as compared with the number of the population, which are useful for statistical purposes, do not go beyond 913. The fundamental changes caused by circumstances in the distribution of the population over the within the war area have made it impossible to give any definite data for comparison with the calculations ent years.

birth rate was practically general (only 29 departments showed a slight
It is, however, probably to some extent due to the increase of the popu
immigration.

As regards the balance between births and deaths, the excess of births ov
amounted to a total of 86,640 births in 44 departments (52 in 1924) and
of deaths of 26,576 in the other 46 (38 in 1924), which shows a natural i
60,064 in the French population in 1925. Since 1920, the annual excess
over deaths has been as follows :

Year	Absolute Figures	Proporti 10,000 Inh
1920	159,790	4
1921	117,023	3
1922	70,579	1
1923	94,871	2
1924	72,216	1
1925	60,064	1

As regards the geographical distribution of births, the highest rate is to
in certain departments of the North and East, of Brittany and Poitou, whi
always rank in the same order. Similarly, the Departments of the valle
Garonne and the Rhone, of the Bourbonnais and the Nivernais show the lo
rates. The following table gives the highest and lowest average annual pr
of children registered as live-born per 10,000 inhabitants in 1913 and 1924-

Highest Rate

1913		1924		1925	
Pas-de-Calais	266	Pas-de-Calais ..	306	Pas-de-Calais	
Finistère	259	Aisne	285	Aisne ..	
Morbihan	247	Moselle	253	Moselle ..	
Seine-Inférieure ..	240	Meurthe-et-Moselle	245	Meurthe-et-Mose	
Meurthe-et-Moselle ..	239	Meuse	244	Morbihan ..	
Côtes-du-Nord ..	237	Marne	240	Marne ..	
Lozère	219	Ardennes	232	Meuse ..	
Doubs	217	Côtes-du-Nord ..	231	Côtes-du-Nord	
Nord	216	Nord	230	Nord ..	
Mayenne	213			Ardennes ..	
Vendée	211				

Lowest Rate

1913		1924		1925	
Gers	129	Creuse	138	Ariège et Creuse	
Lot-et-Garonne ..	139	Ariège	143	Nièvre ..	
Yonne	137	Gers ..	145	Gers-et-Lot ..	
Nièvre	141	Nièvre ..		Cher	
Allier	143	Cher	146	Allier ..	
Lot	145	Allier	143	Lot-et-Garonne	
Haute-Garonne ..	146	Lot	149	Pyrénées-Orienta	
Creuse	147	Lot-et-Garonne ..	150	Basses-Alpes	
Tarn-et-Garonne ..	147	Haute-Garonne ..	155	Gard ..	
Gironde	148	Yonne	156	Haute-Garonne	
Ariège	149	Landes ..	163		
		Pyrénées-Orientales			

, is interesting to note that the Department of Pas-de-Calais always shows the t birth rate because the population is composed principally of miners who are ı to produce the largest number of children in all countries. As, moreover, 7.3 deaths per 10,000 inhabitants have been registered for this department, stands at the head of the list for the excess of births over deaths (14,145 excess , *i.e.*, 143 per 10,000 inhabitants).

enerally speaking, the coefficients of the birth rate obtained from the rural ıtions are slightly higher than those relating to France as a whole.

ı the Department of the Seine the coefficients per 10,000 inhabitants calculated 5 were :

Paris (47,198 live births)	162.4
Suburban communes (30,622 live births)	203.4
Whole department (77,820 live births)	176.4

ı France, the maximum number of births is almost always in March, both as s live-born and still-born children. The minimum occurs regularly in November. ccurate data regarding the distribution of births according to sex and legitimacy t be available until the General Statistical Department has compiled the detailed ics on the subject, but it may be stated that before the war [1], for the period 913, the proportion of live-born boys to girls was between 104 and 105 to 100 ; case of still-born children, the proportion was considerably higher : between d 136 to 100. In each category, the proportion was more marked among the than among the urban populations. On the other hand, the proportion of mate children per 1,000 births was about 88 to 90. As might be expected, 'oportion increased considerably during the war (130 to 140 per 1,000 births 'n 1916 and 1919), a high rate, which obviously could not be maintained. The tion of legitimate to illegitimate children per 10,000 inhabitants has always been in the department of the Seine than in the urban or rural population ; this is by the figures for 1913 :

	Department of the Seine	Urban population	Rural population	France as a whole
egitimate children	137	163	183	171
legitimate children	40	22	8	17
Total	177	185	191	188

) *Still-births.*—It should be noted that French statistics classify under still- infants which are registered dead ; *i.e.*, they were born alive, but died before ation, which must take place within three days of birth.

ıe numbers registered in 1913 and from 1920 to 1925 showing the proportion -births to the total number of births registered (live births and still-births) follows :

Year	Still-births for 90 Departments	Proportion per 1,000 Births
1913	35,987	43
1920	38,641	44
1921	37,809	45
1922	34,854	44
1923	33,591	42
1924	31,697	40
1925	31,531	39

listique générale de la France (Vital Statistics), Vol. II., 1911, 1912, 1913.

The number of still-births appears to have been steadily decreasing of recen as regards 1925, this is the more remarkable inasmuch as the number of liv registered has increased.

The proportion of still-births in the various departments is extremely v It is lowest in the departments of the West and South-west (Corsica and 24 per 1,000 births registered both as live births and still-births) ; Vendée, 26 28 ; Deux-Sèvres, Haute-Vienne, 29). It is always much higher in the Sou especially in Provence (Alpes-Maritimes, 57 ; Savoy, 49 ; Bouches-du-Rhô Vaucluse, 48 ; Var, 46 ; Gard, 45) and in the districts comprising great in centres (Nord, Pas-de-Calais, Seine-Inférieure, 42).

The number of still-births has always been higher in the department of t and among the urban population as compared with the rural population, regards legitimate and illegitimate children.

In 1913, the proportion of still-births per 1,000 of the total number o (registered live births and still-births) of legitimate and illegitimate children follows :

Legitimate	42
Illegitimate	68
Average proportion	43

5. *Mortality.*

(a) *General Rate.*—The proportion of the number of deaths to the total of the population in 1913 was 176 per 10,000 inhabitants. The coefficient of m after increasing perceptibly during the war (1914, 207 ; 1916, 198 ; 1917, 202), a to 246 in 1918 on account of the influenza epidemic, has been falling since 191 and the proportion is now lower than it was before the war. But 1925 sho increase in the number of deaths (29,000 more than in 1924), raising the rate

(b) *Number of Deaths according to Departments.*—This increased death r noticeable almost throughout the country, only 11 departments remaining una Strictly speaking, there is no district in France where the death rate is char tically low ; departments in which the proportions of deaths per 10,000 inh are the lowest are scattered throughout the country. On the other hand, it is always in the same departments that the highest death rate has been found, as in the preceding years. This applies to Normandy, certain districts in the east and, latterly, the suburbs of Paris. The following table for the years 19 1924-25 gives the departments classified according to the highest and lowes as, however, no account is taken of the composition of the population acco age, the significance of these figures must not be accepted at its surface value.

Highest Rate

1913		1924		1925	
Calvados	230	Lot-et-Garonne ..	209	Orne ..	
Orne	225	Lot	207	Vaucluse ..	
Manche	215	Tarn-et-Garonne ..	206	Yonne ..	
Seine-Inférieure ..	214	Vaucluse	205	Calvados ..	
Cher	208	Yonne	200	Tarn-et-Garonne	
Côtes-du-Nord ..	203	Gers	198	Lot-et-Garonne	
Lot	203	Calvados	197	Hautes-Pyrénées	
				Gers ..	

1913		1924		1925	
ıse et Htes-Alpes	201	Basses-Alpes ..	196	Seine-et-Oise	205
-Garonne ..	197			Seine-et-Marne	204
-Vilaine ..	196			Ille-et-Vilaine	
				Haute-Garonne ..	205
				Lot	202

Lowest Rate

1913		1924		1925	
.. ..	161	Moselle	138	Haut-Rhin	139
.. .. ..	142	Corse	141	Bas-Rhin	148
.. ..	146	Haut-Rhin	142	Moselle	151
.. .. ..	150	Belfort, Bas-Rhin ..	145	Nord	157
.. ..	152	Finistère	151	Finistère	158
Corrèze, Haute-					
ne..	151	Nord	152	Landes	160
Sèvres	157	Landes	156	Belfort	161
.. .. ..	161			Haute-Vienne ..	162

Number of Deaths according to Groups of the Population.—If the general rate is calculated for groups of the population according to their importance communes with 30,000 inhabitants and over, communes with 5,000 inhabitants er, communes with less than 5,000 inhabitants), as is done in the *Statistique re de la France*, the following results are obtained for the years 1906 to 1913 :

AL DEATH RATE FROM 1906 TO 1913 FOR PARIS, TOWNS WITH 30,000 INHABITANTS ID OVER, TOWNS WITH 5,000 INHABITANTS AND OVER, TOWNS WITH LESS AN 5,000 INHABITANTS, AND FRANCE AS A WHOLE, PER 1,000 INHABITANTS.

	Paris	Towns with 30,000 inhab. and over	Towns with 5,000 inhab. and over	Towns with less than 5,000 inhabitants	France as a whole
.. ..	17.6	21.6	21.1	19.4	19.8
.. ..	18.4	21.7	21.3	19.7	20.2
.. ..	17.3	20.4	20.4	18.3	18.9
.. ..	17.2	20.5	20.6	18.6	19.1
.. ..	16.2	19.0	19.2	17.4	17.8
.. ..	17.2	20.5	21.0	19.2	19.6
.. ..	16.5	18.8	19.2	16.8	17.5
.. ..	15.6	19.3	19.4	17.2	17.7

is table shows that the death rate among the rural population is always lower mong the urban population (excepting Paris). It is interesting to note that th rate in Paris is considerably lower than in France taken as a whole. The ent of mortality per 10,000 inhabitants in the department of the Seine, including nd its suburbs, for 1925 was as follows :

ris (42,675 deaths)	146.8 deaths
burbs (30,072 deaths)	199.8 deaths
hole Department (72,747 deaths)	164.9 deaths

Number of Deaths according to Seasons.—Statistics showing the death rate ng to seasons throw a new light upon the situation in France : the influence

of the seasons shows itself particularly in relation to age and is most heavily among the very old and the very young. The *Statistique sanitaire de la* gives the following figures for the number of deaths per month in 1913 for the t important age-groups in this connection, *i.e.*, children under 5 years of age and of 60 and over.

NUMBER OF DEATHS PER MONTH FOR THE TWO EXTREME AGE-GROUP IN 1913.

Month	Children under 5 years of age	Persons of age
January	880	1,0
February	878	9
March	936	1,0
April	842	9
May	829	8
June	727	6
July	791	7
August	998	6
September	1,009	6
October	818	7
November	616	7
December	676	9

(e) *Number of Deaths according to Sex.*—Considered from the point of sex, there is a higher proportion of deaths among males than among fema the average annual number of deaths for the periods 1896-1905 and 190 compared with the census returns (in 1901 and 1911) classified according to following coefficients will be obtained per 10,000 inhabitants of either sex :

	Period 1896-1905	Period 1906-13
Male	215	201
Female	193	179
Average	204	190

(f) *Number of Deaths according to Age.*—To show the death rate accor age, which is one of the most instructive statistical methods, a series of table from the official publication, *Statistique sanitaire de la France*, is given below. include the year 1921, others end with the year 1913, for the reasons alread above.

[1] Reference has already been made to this work.

1. MORTALITY FROM 1906 TO 1913 ACCORDING TO THE FIVE MAIN AGE-GROUPS.

Years	Total Number of Deaths	Proportion per 1,000 inhabitants	Under 1 year		From 1 to 19 years		From 20 to 39 years		From 40 to 59 years		At 60 and over	
			Actual number	Per 1,000 births	Actual number	Per 1,000 inhab.	Actual number	Per 1,000 inhab.	Actual number	Per 1,000 inhab.	Actual number	Per 1,000 inhab.
1906	778,400	19.86	119,237	147.7	76,465	6.1	93,032	7.8	134,999	15.1	354,667	72.0
1907	793,467	20.20	104,386	135.0	75,509	6.0	95,384	8.0	142,635	15.7	375,553	75.9
1908	744,694	18.92	102,269	129.0	70,913	5.7	90,471	7.5	134,145	14.9	346,896	69.8
1909	755,442	19.16	92,622	120.3	68,532	5.5	88,672	7.3	134,842	15.2	368,774	73.9
1910	704,770	17.84	88,033	113.6	66,006	5.3	84,345	6.9	127,296	14.1	339,090	67.7
1911	775,088	19.59	118,205	159.2	73,067	5.8	88,296	7.2	130,020	14.3	365,500	72.7
1912	692,768	17.51	79,860	106.3	65,457	5.2	85,363	7.0	127,795	14.1	334,293	66.5
1913	702,746	17.76	84,874	113.8	65,584	5.2	84,131	6.9	126,548	13.9	341,609	67.9

2. MORTALITY RATE PER 1,000 INHABITANTS ACCORDING TO FIVE AGE-GROUP
1906 TO 1913.

Year	Total mortality	Age-Groups				
		Under 1 year	From 1 to 19 years	From 20 to 39 years	From 40 to 59 years	60 ye
1906 ..	19.86	3.0	1.95	2.37	3.44	9
1907 ..	20.20	2.66	1.92	2.43	3.63	9
1908 ..	18.92	2.60	1.80	2.30	3.41	8
1909 ..	19.16	2.35	1.74	2.25	3.47	9
1910 ..	17.84	2.23	1.67	2.13	3.22	8
1911 ..	19.59	2.98	1.84	2.23	3.28	9
1912 ..	17.51	2.01	1.65	2.15	3.23	8
1913 ..	17.76	2.14	1.65	2.12	3.19	8

3. MORTALITY FROM 1906 TO 1921 FOR FIVE AGE-GROUPS WITH THE PERCENT
RATE OF DEATHS FROM ALL CAUSES.

Year	Under 1 year	From 1 to 19 years	From 20 to 39 years	From 40 to 59 years	60 y and
1906..	15.32	9.82	11.95	17.34	45.
1907..	13.15	9.52	12.02	17.98	47.
1908..	13.73	9.52	12.15	18.02	46.
1909..	12.26	9.07	11.74	18.11	48.
1910..	12.49	9.37	11.97	18.06	48.
1911..	15.25	9.43	11.39	16.77	47.
1912..	11.52	9.45	12.32	18.45	48.
1913..	12.08	9.33	11.97	18.00	48.
1914..	10.40	8.09	15.85	17.73	47.
1915..	8.75	10.00	14.69	18.72	47.
1916..	6.83	9.71	13.19	18.94	51.
1917..	7.10	8.86	13.21	18.44	52.
1918..	7.60	11.11	21.80	19.17	40.
1919..	8.30	8.67	14.73	19.24	49.
1920..	11.83	7.88	12.21	18.61	49.
1921..	13.56	7.30	11.25	18.19	49.

These tables show that the general death rate has fallen in France in al groups, but the third table (percentage according to age) shows that the g death rate was considerably increased by the high proportion of deaths amon aged, which is connected with a very characteristic demographical phenomen

e, *i.e.*, the high proportion of persons over 60 ; this group actually represents r cent of the total population of France. Nevertheless, the death rate is nely high between 20 and 45 years, especially among males, which is chiefly nted for by deaths from tuberculosis.

) *Number of Deaths according to Causes.*—The following tables, showing the er of deaths classified according to causes, have also been taken from the *Statis-anitaire de la France.*

ORTALITY ACCORDING TO CAUSES FROM 1906 TO 1913 (38 CAUSES TAKEN FROM THE ABRIDGED INTERNATIONAL LIST).

Causes of Death International Nomenclature	1906	1907	1908	1909	1910	1911	1912	1913
yphoid fever or Paratyphoid (abdominal yphus)	0.14	0.13	0.12	0.10	0.08	0.13	0.09	0.09
xanthematic typhus	0.00	—	—	—	—	0.001	0.001	0.000
alarial fever and Cachexia	0.01	0.01	0.01	0.01	0.015	0.011	0.007	0.007
nallpox	0.02	0.07	0.004	0.002	0.002	0.002	0.003	0.01
easles	0.10	0.10	0.08	0.07	0.09	0.10	0.12	0.12
arlet fever	0.02	0.04	0.04	0.04	0.02	0.02	0.03	0.02
hooping-cough	0.09	0.09	0.09	0.07	0.07	0.07	0.06	0.07
iphtheria and Croup	0.08	0.09	0.09	0.09	0.07	0.07	0.07	0.06
nfluenza	0.18	0.41	0.20	0.29	0.15	0.24	0.12	0.15
siatic Cholera	0.00	—	—	—	—	0.007	0.000	0.001
noleriform enteritis	0.04	0.02	0.02	0.01	0.01	0.02	0.004	0.003
her epidemic diseases	0.05	0.04	0.04	0.04	0.03	0.03	0.05	0.03
uberculosis of the respiratory system	1.82	1.90	1.86	1.78	1.79	1.80	1.76	1.77
uberculosis of the meninges or of the cen-ral nervous system	0.17	0.17	0.16	0.16	0.17	0.16	0.16	0.17
her forms of tuberculosis	0.22	0.22	0.22	0.20	0.19	0.19	0.19	0.19
ncer and other malignant tumours	0.70	0.75	0.76	0.77	0.79	0.80	0.80	0.83
eningitis	0.40	0.44	0.43	0.41	0.37	0.40	0.35	0.36
æmorrhage and Softening of the brain	1.21	1.37	1.35	1.42	1.17	1.16	1.11	1.11
seases of the heart (excluding angina pec-oris)	1.27	1.47	1.43	1.49	1.40	1.40	1.42	1.41
ute bronchitis (including general bron-hitis in children under 5)	0.37	0.46	0.39	0.42	0.37	0.39	0.34	0.34
ronic bronchitis (including general bron-hitis at the age of 5 and over)	0.42	0.50	0.45	0.46	0.41	0.44	0.38	0.38
eumonia	0.91	1.02	0.87	0.98	0.79	0.87	0.82	0.80
her diseases of the respiratory system except Phthisis)	0.85	1.04	0.96	1.06	0.99	1.05	1.02	0.98
seases of the stomach (except Cancer)	0.21	0.23	0.21	0.21	0.19	0.20	0.19	0.18
arrhœa and Enteritis (under 2 years)	1.06	0.78	0.84	0.65	0.62	1.34	0.56	0.68
ppendicitis, Typhlitis	—	—	—	—	0.04	0.04	0.03	0.04
rnia, Intestinal obstruction	0.13	0.15	0.14	0.15	0.14	0.15	0.14	0.14
rhosis of the liver	0.19	0.19	0.19	0.18	0.18	0.18	0.18	0.18
ute or chronic nephritis	0.26	0.29	0.28	0.29	0.30	0.30	0.31	0.32
n-cancerous tumours and other diseases f the female genital organs	0.05	0.06	0.06	0.06	0.05	0.06	0.05	0.06
erperal septicæmia (Puerperal fever, Peri-onitis, Phlebitis)	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.04
her puerperal accidents of pregnancy and bour	0.06	0.06	0.06	0.05	0.06	0.05	0.04	0.04
ngenital debility and malformation	0.62	0.63	0.62	0.61	0.57	0.61	0.52	0.53
nility	2.64	2.75	2.61	2.77	2.58	2.86	2.58	2.70
olent deaths (except Suicide)	0.47	0.50	0.47	0.47	0.47	0.51	0.51	0.51
icide	0.20	0.23	0.21	0.22	0.21	0.21	2.23	0.22
her diseases	2.26	2.34	2.26	2.29	2.22	2.33	2.13	2.16
seases not specified or ill-defined	2.63	1.63	1.30	1.22	1.14	1.24	1.02	0.98

2. MORTALITY ACCORDING TO THE PRINCI

Cause	Year	0-1 year		1-19 years		20-39 years		40-59 years	
		Actual number	Proportion per 10,000 births	Actual number	Proportion per 10,000 inhabitants	Actual number	Proportion per 10,000 inhabitants	Actual number	Proportion per 10,000 inhabitants
1 — Typhoid fever.	1911	70	0.94	1,560	1.25	2,542	2.09	874	0.96
	1912	39	0.51	1,177	0.94	1,720	1.41	593	0.65
	1913	42	0.56	1,179	0.94	1,654	1.36	584	0.64
	1919	25	0.62	661	—	717	—	330	—
	1920	31	0.30	833	—	906	—	396	—
	1921	51	0.66	877	—	1,000	—	507	—
4 — Smallpox.	1911	28	0.30	29	0.02	—	—	—	—
	1912	21	0.28	36	0.03	—	—	—	—
	1913	105	1.40	159	0.12	—	—	—	—
	1919	33	0.82	42	—	—	—	—	—
	1920	36	0.45	47	—	—	—	—	—
	1921	40	0.41	25	—	—	—	—	—
5 — Measles.	1911	1,205	16.24	2,643	2.13	—	—	—	—
	1912	1,529	20.37	3,271	2.63	—	—	—	—
	1913	1,530	20,52	3,104	2.49	—	—	—	—
	1919	334	8.28	776	—	—	—	—	—
	1920	490	6.17	910	—	—	—	—	—
	1921	607	7.86	929	—	—	—	—	—
6 — Scarlet fever.	1911	138	1.86	654	0.53	—	—	—	—
	1912	148	1.97	995	0.80	—	—	—	—
	1913	133	1.78	710	0.57	—	—	—	—
	1919	68	1.69	351	—	—	—	—	—
	1920	118	1.48	402	—	—	—	—	—
	1921	157	2.03	352	—	—	—	—	—
7 — Whooping-cough.	1911	1,784	24.04	1,114	0.90	—	—	—	—
	1912	1,456	19.39	887	0.71	—	—	—	—
	1913	1,956	26.23	1,140	0.91	—	—	—	—
	1919	598	14,82	457	—	—	—	—	—
	1920	1,322	14.65	744	—	—	—	—	—
	1921	681	8.82	332	—	—	—	—	—
8 — Diphtheria and Croup.	1911	487	6.56	2,121	1.71	—	—	—	—
	1912	382	5.08	2,244	1.80	—	—	—	—
	1913	399	5.35	1,868	1.50	—	—	—	—
	1919	358	8.87	1,462	—	—	—	—	—
	1920	493	6.21	1,648	—	—	—	—	—
	1921	633	8.99	1,800	—	—	—	—	—
9 — Influenza.	1911	931	12.54	774	0.62	669	0.55	1,243	1.37
	1912	643	8.56	578	0.46	420	0.34	723	0.79
	1913	746	10.00	712	0.57	520	0.42	883	0.97
	1918	2,530	65.94	18,618	—	40,431	—	18,542	—
	1919	1,741	43.15	6,128	—	11,336	—	8,093	—
	1920	828	10.43	1,602	—	2,259	—	2,136	—
	1921	946	12.25	1,067	—	1,307	—	1,232	—
13 — Pulmonary tuberculosis.	1911	651	8.77	10,051	8.09	35,199	28.94	20,196	22.31
	1912	550	7.32	9,239	7.43	34,315	28.27	20,541	22.68
	1913	611	8.19	9,763	7.85	33,831	27.84	20,604	22.75
	1919	320	7.93	8,090	—	25,960	—	16,197	—
	1920	484	6.09	7,804	—	25,338	—	16,154	—
	1921	621	8.04	8,106	—	27,446	—	17,912	—
14 — Tuberculosis of the meninges.	1911	1,061	14.30	4,037	3.25	1,180	0.97	522	0.58
	1912	843	11.23	3,819	3.07	1,187	0.97	473	0.52
	1913	922	12.36	3,896	3.13	1,194	0.98	504	0.55
	1919	479	11.87	2,461	—	1,045	—	485	—
	1920	795	8.01	2,646	—	1,120	—	497	—
	1921	910	11.78	2,628	—	1,245	—	522	—
15 — Other forms of tuberculosis.	1911	313	4.22	1,978	1.15	2,635	2.17	1,899	2.10
	1912	244	3.26	1,890	1.52	2,589	2.13	2,015	2.22
	1913	273	3.65	1,861	1.49	2,709	2.23	1,924	2.12
	1919	145	3.59	1,445	—	2,569	—	1,810	—
	1920	196	2.46	1,408	—	2,450	—	1,976	—
	1921	244	3.16	1,455	—	2,580	—	2,094	—

AGE-GROUP FROM 1911 TO 1913.

	Year	0-1 year		1-19 years		20-39 years		40-59 years		60 years and over	
		Actual number	Proportion per 10,000 births	Actual number	Proportion per 10,000 inhabitants	Actual number	Proportion per 10,000 inhabitants	Actual number	Proportion per 10,000 inhabitants	Actual number	Proportion per 10,000 inhabitants
nd other tumours	1911	58	0.78	255	0.21	1,632	1.34	11,472	12.67	18,351	36.52
	1912	51	0.68	210	0.17	1,606	1.32	11,504	12.70	18,502	36.82
	1913	50	0.67	259	0.20	1,658	1.36	11,718	12.90	19,149	38.11
	1919	30	0.74	177	—	1,311	—	9,418	—	13,545	—
	1920	48	0.60	212	—	1,311	—	10,588	—	16,168	—
	1921	142	1.83	261	—	1,477	—	11,514	—	19,119	—
.	1911	5,290	71.29	7,646	6.15	1,386	1.14	—	—	—	—
	1912	3,888	51.77	7,122	5.73	1,433	1.18	—	—	—	—
	1913	4,248	56.92	7,295	5.87	1,460	1.20	—	—	—	—
	1919	2,158	53.48	4,359	—	1,154	—	—	—	—	—
	1920	3,337	42.04	4,549	—	1,146	—	—	—	—	—
	1921	4,654	60.28	4,659	—	1,266	—	—	—	—	—
iseases of t.	1911	335	4.51	1,262	1.02	3,255	2.68	13,098	14.47	37,674	74.98
	1912	317	4.22	1,320	1.06	3,445	2.83	13,274	14.66	37,929	75.49
	1913	349	4.68	1,185	0.95	3,327	2.73	12,802	14.14	38,161	75.95
	1919	183	4.54	827	—	2,776	—	11,262	—	29,678	—
	1920	335	4.22	1,018	—	2,801	—	11,618	—	31,471	—
	1921	465	6.02	1,136	—	3,022	—	12,487	—	35,766	—
nchitis.	1911	4,827	65.04	2,739	2.20	1,252	1.03	1,866	2.09	4,749	9.45
	1912	4,270	56.88	2,648	2.13	1,007	0.82	1,655	1.82	4,099	8.15
	1913	4,273	57.31	2,550	2.05	1,094	0.09	1,629	1.79	4,087	8.13
	1919	1,822	45.15	1,593	—	1,234	—	1,835	—	3,207	—
	1920	2,508	31.60	1,523	—	1,087	—	1,564	—	3,215	—
	1921	2,985	38.66	1,403	—	922	—	1,376	—	3,273	—
ronchitis.	1911	477	6.43	930	0.75	2,290	1.88	3,755	4.15	9,990	19.88
	1912	375	4.99	849	0.68	2,136	1.75	3,386	3.74	8,557	17.03
	1913	425	5.70	872	0.70	2,185	1.79	3,502	3.86	8,293	16.50
	1919	237	5.87	685	—	1,986	—	3,599	—	7,334	—
	1920	277	3.49	649	—	1,626	—	3,353	—	6,883	—
	1921	404	2.88	631	—	1,630	—	3,416	—	7,264	
a.	1911	3,357	45.23	3,516	2.83	3,399	2.86	6,599	7.29	17,842	35.51
	1912	3,298	43.93	3,386	3.08	3,129	2.57	6,368	7.03	15,834	31.57
	1913	3,257	43.68	3,739	3.01	3,155	2.59	6,070	6.70	15,460	30.71
	1918	1,821	47.46	5,895	—	13,685	—	9,074	—	13,026	—
	1919	1,705	42.26	3,168	—	4,884	—	6,443	—	11,832	—
	1920	2,506	31.53	2,839	—	3,355	—	5,627	—	12,451	—
	1921	3,055	39.56	2,462	—	2,727	—	5,649	—	12,976	—
and En- (under 2	1911	46,769	630.21	—	—	—	—	—	—	—	—
	1912	20,012	266.59	—	—	—	—	—	—	—	—
	1913	23,971	321.52	—	—	—	—	—	—	—	—
	1919	13,266	328.77	—	—	—	—	—	—	—	—
	1920	19,766	249.06	—	—	—	—	—	—	—	—
	1921	30,962	401.03	—	—	—	—	—	—	—	—
debility alforma-	1911	22,950	309.25	—	—	—	—	—	—	—	—
	1912	19,549	260.42	—	—	—	—	—	—	—	—
	1913	20,017	268.94	—	—	—	—	—	—	—	—
	1919	16,620	337.54	—	—	—	—	—	—	—	—
	1920	20,435	257.49	—	—	—	—	—	—	—	—
	1921	21,068	272.88	—	—	—	—	—	—	—	—
	1911	—	—	—	—	—	—	—	—	111,697	222.31
	1912	—	—	—	—	—	—	—	—	100,496	200.01
	1913	—	—	—	—	—	—	—	—	105,564	210.10
	1919	—	—	—	—	—	—	—	—	103,607	—
	1920	—	—	—	—	—	—	—	—	103,511	—
	1921	—	—	—	—	—	—	—	—	110,164	—
	1911	118,205	1592.81	73,067	58.80	88,296	72.67	130,020	143.60	365,500	727.45
	1912	79,860	1063.87	65,457	52.68	85,363	70.26	127,795	141.15	334,293	665.34
	1913	84,874	1138.42	65,584	52.78	84,131	69.25	126,548	139.77	341,609	679.90
	1019	48,665	1206.06	50,859	—	86,348	—	112,866	—	287,713	—
	1920	71,107	895.98	47,330	—	73,349	—	111,868	—	297,355	—
	1921	88,294	1143.62	47,548	—	73,273	—	118,450	—	323,782	—

3. PROPORTIONAL MORTALITY FROM THE SEVEN PRINCIPAL DISEASES, 1906 TO

Year	Epidemic or Infectious Diseases	Tuberculosis of all kinds	Pneumonia, Bronchitis and other diseases of the respiratory system (except Phthisis)	Cancer	Organic diseases of the heart	Infantile Diarrhœa	
1906..	2.94	11.19	12.82	3.51	6.41	5.36	
1907..	3.16	11.35	14.97	3.69	7.25	3.87	
1908..	2.81	11.87	14.19	4.05	7.58	4.46	
1909..	2.44	11.24	15.33	4.06	7.80	3.41	
1910..	2.51	12.08	14.41	4.41	7.86	3.50	
1911..	2.73	11.11	14.08	4.10	7.18	6.87	
1912..	2.72	12.09	14.71	4.60	8.12	3.23	
1913..	2.64	12.02	14.13	4.67	7.94	3.86	
1914..	3.01	11.10	13.93	3.82	7.47	3.44	
1915..	3.54	11.85	14.16	3.85	8.06	2.60	
1916..	2.62	12.22	14.14	4.27	8.55	2.20	
1917..	2.24	12.36	15.32	4.28	8.40	2.11	
1918..	2.09	10.31	16.66	3.32	4.54	6.36	
1919..	1.85	11.34	15.09	4.17	7.63	2.57	
1920..	2.25	11.12	14.22	4.71	7.86	3.57	
1921..	2.26	11.05	13.30	4.99	8.12	5.21	

The principal facts to be deduced from these tables are as follows :

(1) There is a marked decrease in the prevalence of epidemic diseases ;

(2) The number of deaths from tuberculosis has hardly decreased in Progress, if any, has been slow and irregular, while in certain other countries, m from tuberculosis has decreased considerably. The fact that a methodical ca against the disease has only been instituted in recent years may partly acco this. Legislation concerning the matter was only passed during the war and the are not yet perceptible. According to the *Statistique sanitaire de la France*, o total of 651,347 deaths in 1921, 71,973 were due to tuberculosis in all form

Pulmonary tuberculosis	59,032
Tuberculosis of the meninges	5,505
Other forms of tuberculosis	7,436

But these figures are really an under-statement of the truth. To the deaths from pulmonary tuberculosis, should be added a number of deaths from " bronchitis " (13,345 in 1921) or of deaths registered under Heading 37, " Diseases ", in the list, both of which often cover pulmonary tuberculosis. From to 90,000 deaths may be attributed yearly to tuberculosis of all kinds in France, average mortality from tuberculosis of 2.31 per 1,000 inhabitants in 1921. Pul tuberculosis alone represents about one-tenth of the general causes of death, higher among the urban than among the rural population ; the risks increase w extension of urban life, and the growing density of population. The death rate the urban and rural population reaches a very high proportion in the districts

west (Brittany, Normandy, Ile-de-France), a fact which is probably accounted climate, housing conditions, the composition of families, etc. A characteristic of tuberculosis in France is that it affects more especially adults between 20 years of age ; out of 71,973 deaths from tuberculosis in 1921, 31,271 were those ons between the ages of 20 and 39, viz. :

Pulmonary tuberculosis	27,446
Tuberculosis of the meninges	1,245
Other forms of tuberculosis	2,580

most half the total ; if chronic bronchitis is added, the gravity of the disease nce will be realised, as the majority of its victims are in the prime of life.

should be pointed out, however, that in Paris the number of deaths from tuber- has steadily decreased and this decrease has been even more marked than that general death rate. In 1885, the number of deaths from pulmonary tuberculosis ill 4.52 per 1,000 inhabitants ; since then there has been a constant decrease :

95	4.11	1912..	3.34
05	3.82	1913..	3.28
10	3.53	1914..	3.29
11	3.52		

ven during the war the improvement continued :

15	3.19	1918..	2.93
16	3.17	1919..	2.48
17	2.95		

ne following are the rates for the last six years :

		Deaths			Deaths
20	2.27	(7,907)	1923	2.31	(7,862)
21	2.44	(8,306)	1924	2.43	(8,219)
22	2.37	(8,077)	1925	2.38	(8,135)

ese results are probably due to the improvement in general health conditions, ore especially to the methodical organisation of the anti-tubercular campaign ted by the Social Health Office of the Department of the Seine, and by private saries, the majority of which are now under its direction. This explains why crease in pulmonary tuberculosis is more marked in certain suburban districts *dissements)* (15th, 18th and 19th, the two latter of which have chiefly a working tion) than in the *arrondissements* with well-to-do populations, in which the dis- ies cannot exercise their influence so effectively.

qually favourable results have already been registered in other large towns in : Lyons, Rouen and Havre, where tuberculosis is now steadily decreasing.

There is an increase in the number of deaths from cancer, but this may be the fact that cancer cases are now more easily diagnosed.

Attention should be drawn to the large number of deaths from senile decay 34 on the List), for the reason pointed out above.

fant Mortality.

General Rate.—From the middle of the nineteenth century until the war, mortality in France decreased consistently. After a suspension of this decrease the war, it has again decreased since 1919, as shown by the following tables :

	Years	Actual number of Deaths from 0-1 Year	Proportion pe 1,000 registere Live Births
For 87 Departments	1856–1865 ..	176,634	179
	1866–1875 ..	168,913	177.5
	1876–1885 ..	156,149	167.1
	1886–1895 ..	146,344	168.3
	1896–1905 ..	124,912	148.7
	1906–1913 ..	96,640	125.6
For 77 uninvaded Departments	1913	83,883	114
	1914	65,471	109.1
	1915	55,488	113
	1916	39,222	112.2
	1917	43,057	131.4
	1918 (year of the influenza epidemic)	56,001	151.1
	1919	49,492	123
For 90 Departments, including Moselle, Bas-Rhin and Haut-Rhin	1920	82,415	99
	1921	93,705 (excessive summer heat)	115
	1922	64,889	85
	1923	73,283	96
	1924	64,287	85
	1925	68,367	89

The proportion of deaths from 0-1 year to the total number of deaths of a shows the same decrease per 1,000 deaths :

	Deaths
1911	150.4
1912	113.2
1913	119.5
1920	105

This decrease may partly be ascribed to the lower birth rate in France, bu undoubtedly mainly due to the improved organisation of the public or private s for the protection of infants and to the combined efforts of legislators, docto hygienists in the campaign against infant mortality.

(b) *Number of Deaths according to Age and Legitimacy.*—It is interest consider the proportional distribution of deaths from 0-1 year between the v age-groups for the first year. The following table, giving the proportions per deaths of infants under 1 year classified according to age and legitimacy, has beer from the *Statistique générale de la France :*

Year	0-4 days	5-9 days	10-14 days	15-29 days	30-60 days	61-90 days	91-180 days	181-270 days	271-365 days
				1. Legitimate Children.					
.. ..	1,400	646	529	1,055	1,139	847	1,876	1,398	1,110
.. ..	1,401	642	476	1,043	1,120	865	1,901	1,401	1,151
.. ..	994	474	463	997	1,102	901	2,231	1,583	1,255
.. ..	1,411	630	480	1,019	1,110	851	1,906	1,396	1,197
.. ..	1,293.	578	454	993	1,141	848	1,976	1,460	1,245
				2. Illegitimate Children.					
.. ..	955	567	524	1,128	1,582	1,058	1,966	1,152	768
.. ..	976	525	508	1,285	1,460	1,134	2,052	1,164	896
.. ..	840	441	433	1,215	1,424	1,103	2,302	1,352	890
.. ..	1,118	530	496	1,296	1,557	1,045	2,025	1,137	796
.. ..	948	491	460	1,293	1,563	1,066.	2,099	1,216	864
				3. Average.					
.. ..	1,332	634	528	1,111	1,208	879	1,889	1,361	1,058
.. ..	1,336	624	481	1,079	1,172	906	1,924	1,365	1,113
.. ..	969	468	459	1,032	1,153	934	2,243	1,546	1,196
.. ..	1,362	614	482	1,066	1,185	883	1,925	1,353	1,130
.. ..	1,234	563	456	1,044	1,214	885	1,997	1,418	1,189

It will be seen that, out of 100 children dying under the age of 1 year :

12-14 did not survive the 5th day;
30-35 were less than 1 month old ;
50 did not survive the 3rd month.

The death rate is highest during the first 5 days after birth; it then rapidly falls the 3rd month, after which there is a more gradual decrease to the end of the year.

The mortality of illegitimate children is, as a rule, higher than that of legitimate ren, as is shown by the figures for the same period, 1909-13 :

NUMBER OF DEATHS IN THE FIRST YEAR PER 1,000 LIVE BIRTHS.

Year	Legitimate Chidren	Illegitimate Children	Average
1909	109.4	203.5	117.7
1910	102.7	193	110.6
1911	144.4	289.4	157.1
1912	95.2	201.4	104.4
1913	102.1	220	112.4

It is a curious fact that the influence of illegitimacy does not become ap until after the 5th day. Illegitimate children aged from 0-4 days show a lowe rate than legitimate children, but, after the 5th day, they die in larger nu especially from the 10th to the 90th day of life.

(c) *Number of Deaths according to Seasons.*—The following table, also take the *Statistique générale*, shows the monthly rate per 10,000 deaths of children 5 years of age for the years 1909 to 1913. It shows clearly the special dan the summer season. The largest numbers of deaths are recorded for Augus September ; the exceptionally hot summer of 1911 caused a very high death ra the case of very young children, the end of the winter, especially the month of often shows another culminating point, sometimes higher even than in the s months.

MONTHLY RATE PER 10,000 DEATHS PER ANNUM.

Month	1909	1910	1911	1912	1
	(Children under 5 years)				
January	926	826	724	796	
February	931	819	709	870	
March	1,073	885	701	900	
April	879	875	656	890	
May	818	935	622	960	
June	690	821	571	850	
July	729	824	921	1,053	
August	930	967	1,679	912	
September	812	841	1,592	651	1,
October	787	771	825	614	
November	685	696	508	669	
December	740	740	492	835	

(d) *Number of Deaths according to Causes.*—A table showing the principal of infant mortality, taken from the official data supplied in the *Statistique sanit la France*, for the years 1911 to 1921 also gives the proportion of deaths per 10,0 births. It shows that diarrhœa is the chief cause of death among infants at the h

In France, gastro-enteritis is responsible for from a third to a quarter total number of deaths ; congenital debility is second on the list, and, durin war, it came first on account of the unfavourable physiological conditions under a large number of women worked in various industries; broncho-pneumonia third : here the official statistics are not quite accurate, for numerous deaths pneumonia may be entered under the heading " Infectious Diseases " (me whooping-cough, influenza), in which pneumonia is frequently a complication the other hand, a number of deaths from tuberculosis may have been included the heading " Broncho-pneumonia ".

The same reservations must be made with regard to tuberculosis itself. O statistics cannot give an accurate idea of the prevalence of tuberculosis am quite young children ; and mistaken diagnosis must be added to the other sour error in statistics concerning infancy.

It is still more difficult to determine how large a factor syphilis is among the c of infant mortality ; it has no special heading in the Abridged International List in French statistics ; even when the cause of death happens to have been cor diagnosed, it is registered under the Heading 37 : " Other Diseases ", and it is ther impossible to estimate to what extent it is responsible for mortality in early inf

ecial reference must be made to infectious diseases, although these are, for the art, less fatal than those referred to above. Few deaths are directly due to eria and scarlet fever (the first rarely occurs under the age of six months, and cond under that of two years), deaths from whooping-cough and measles are more numerous, for in France, as in other countries, these diseases, although vere, are frequently followed by dangerous complications such as broncho-onia.

propriations for Health Expenditure in 1925.

(a) MINISTRY OF LABOUR, HEALTH, PUBLIC ASSISTANCE AND SOCIAL WELFARE.

	Francs
xpenditure incurred under the Law of February 15th, 1902, ning the protection of public health[1], approximately	1,300,000
DEPARTMENT OF PUBLIC ASSISTANCE AND HEALTH.	
Child Welfare (Second Section).	
apter 7 : Grants to maternity and infant welfare institutions	1,000,000
apter 18 : Grants to institutions for the protection of children berculosis recognised as establishments of public utility ..	240,000
Social Hygiene (Fourth Section)[2].	
mpaign against tuberculosis	19,810,000
mpaign against venereal diseases	5,200,000
mpaign against cancer	1,000,000
General Hygiene and Sanitation (Fifth Section).	
apter 31 : Grants to bacteriological laboratories	761,800
apter 33 : Analyses by the Academy of Medicine for official al of springs	1,500
Prophylaxis and Epidemics (Sixth Section).	
apter 82 : National Central Council of Public Health and tory of the Ministry of Health	57,200
apter 83 : General Hygiene and Sanitation	1,950,000
apter 84 : Maritime Health Service : Salaries	755,000
apter 85 : Maritime Health Service : Allowances	160,300
apter 86 : Maritime Health Service : Material and Miscel-Expenses	245,000
Carried forward	35,480,800

spect of expenditure incurred under the Law of February 15th, 1902, on the Protection of Public Health, the ts and communes as a general rule receive State grants, according to scales which are based for each depart-e value of the department tax of 1 per cent per square kilometer and the value of the additional 1 per cent for nes. The proportion of grants varies between 10 and 90 per cent.
hapter III, §§ 1 *(a)*, 2 *(a)*, 3 *(a)*.

	Fran
Brought forward	35,480
A further supplementary credit must be added to this chapter, estimated at	40
Chapter 87 : Work of the Permanent Commission for the Protection against Tuberculosis	10
Chapter 37 : Technical Health advisers	10
Total	35,540

Note.—In addition to the sums mentioned above, the State has certain reve its disposal, as, for example, the tax on the proceeds of the *pari mutuel* (see *Ye* 1924, page 148.

In 1925, 350 applications for subsidies were considered by the Committee appo distribute these proceeds ; the grants to charitable institutions, hospitals, hospices, a orphanages, lying-in hospitals, crèches, infants' homes, dispensaries, etc., amounted 39,703,000 francs.

From 1891 to 1925, 345 million francs derived from the funds of the *pari mutu* been used for establishing, improving or developing public or private social services.

(b) MINISTRY OF THE INTERIOR.

	Fran
Grants made out of the Proceeds of the Club and Casino Taxes :	
For the construction of sewers	10,386
Shower-bath establishments	3,634
Work connected with cemeteries (transfers and extensions)[1]	919
Total	14,940

(c) MINISTRY OF AGRICULTURE.

	Fran
Grants for water-supply schemes[2] made by the *Pari mutuel* Committee	32,424

(d) APPROPRIATIONS FOR THE HEALTH SERVICES OF THE CITY OF PARIS AI PREFECTURE OF THE SEINE.

	Fran
Total	114,958

[1] It would perhaps be useful to recall that under a law dated June 5th, 1907, as supplemented in 1920 and 19 stakes in clubs and casinos are subject to a tax which varies from 10 to 50 per cent according to the revenu houses and establishments.

A portion of this sum is employed in the form of grants for the work referred to above; the grants are all Committee which sits at the Ministry of the Interior and includes representatives of the various Ministries

In 1925, this Committee dealt with 94 schemes for sewerage systems and made grants amounting to 10,386, towards a total expenditure of 35,103,000 francs.

Twenty-eight shower-bath establishments costing 15,630,000 francs in all received a total grand of 3,634,

Seventy schemes for the transfer or enlargement of cemeteries, involving a total cost of 3,667,500 francs, g rant of 919,500 francs.

[2] In 1925, the number of water-supply schemes receiving grants from the proceeds of the *pari mutuel* an 393 for uninvaded areas and 247 for the liberated areas.

Grants amounted to 18,955,933 francs for schemes in uninvaded areas and 13,468,423 francs for schemes i areas, making a total of 32,424,356 francs.

1. *Social Hygiene.*

	Francs
;ant to the Public Office of Social Hygiene of the Depart-)f the Seine for the placing with families in the country, or atoria of children belonging to large families in Paris who fering from or threatened with tuberculosis	500,000
;ants towards the working expenses of child welfare insti-	70,000
;ant for placing children in the convalescent home at Boulogne	46,520
;ant to children's dispensaries for the distribution of steri- ilk..	3,000
;ant to the Public Assistance Department for the reception : women in the Larue Sanatorium	224,840
;ant in aid of Paris crèches	399,200
spection of crèches, dispensaries, philanthropic and chari- nstitutions in the city of Paris and the Department of the and inspection of laundries and kitchens of charitable tions	58,120
;ants to various dispensaries for sick children	120,000
;ant to the Association for the Protection of Children from ulosis	18,000
;ant to the Federation of Mothers' Canteens	110,000
;ants towards the working expenses of evening anti-venereal ations at the six general hospitals and three special hospitals	255,268
Total	1,804,948

2. *School Hygiene.*

ir Schools and Classes :	Francs
stablishment and working expenses, grants, tuition, research scellaneous	100,000
dical inspection of the educational establishments of the Paris and of private schools	634,260
sinfection of schools (staff and material)	45,000
rmanent disinfection of premises and lavatories ; provision ver-baths	65,600
-vaccination of pupils in the communal schools	3,800
oliday excursions in the neighbourhood of Paris	40,000
hool camps	600,000
;ant to the Tuberculosis Sanatorium at Sainte-Feyre (Creuse)	3,000
Total	1,491,660

3. *Street Sanitation.*

moval of household refuse, mud and general refuse :	Francs
(a) Contract work	36,182,000
(b) Monopoly work	337,000
sposal of household refuse : Monopoly	17,625,000
Carried forward	54,144,000

	Fr
Brought forward	54,144
Cleaning and upkeep of portable lavatories and small portable structures	81
Upkeep of urinals in the public streets	35
Work incumbent on the Department and performed on behalf of private persons in the interests of public safety and hygiene ..	80
Upkeep of urinals in parks, etc.	7
Markets, covered and open : upkeep and scavenging	320
Washing and disinfection of open markets in hot weather ..	16
Cemeteries : upkeep and cleaning of sewers and cesspools ..	19
Upkeep of fountains, hydrants and urinals	14
Total	54,717

4. *Health Services.*

	Fra
Share of Health Services in annual payments on general loans	6,499
Refund to the Department of the contribution of the city of Paris to expenditure on public health protection	90
Insanitary Dwellings Committee	65
Committee for the Supervision and Improvement of the Health Services	1
Research expenses of the Commission of Enquiry into the Influence of the Dwelling on the Ætiology and Propagation of Tuberculosis	2
Proportionate share in the expenditure on outside staff	466
Proportionate share in the expenditure on pensions and relief	264
Museum of hygiene : staff and material	133
Technical Department for the hygiene of dwelling-houses and the sanitary register :	
Salaries	185
Presents and material	
Cost of drawing up plans for the application of the Law of July 22nd, 1912	2
Proportionate share of Health Services in cost of material ..	1,902
Proportionate share of Health Services in cost of lighting ..	92
Proportionate share of Health Services in water-rate	69
Laboratories :	
(a) General services	22
(b) Laboratory of Hygiene :	
Staff 387,466.70	
Allowances 10,550	
Upkeep and miscellaneous laboratory expenses 32,540	
430,556.70	430
Carried forward	10,224

		Francs
	Brought forward	10,224,010.11
(d) Inspection of water supply :		
Staff	476,282	
Allowances and miscellaneous ..	17,660	
Honoraria	590	
Material and laboratory expenses	106,530	
	601,062	601,062
(f) Medical inspection of springs		2,400
bscription of the city of Paris to the General Association		
icipal Public Health and Technical Officials		150
are in fire insurance premiums for city property		170
are in annual payment for conveyance of residual waters		
rs		300
are in cost of central heating		408
nt of premises for technical disinfection and ambulance		
.. ..		6,396
nicipal disinfection service :		
Staff		1,178,000
Equipment		80,289
ıtral notification and control station for disinfection and		
nces		22,590
ccination at private houses and at municipal public assist-		
tablishments		8,400
ıtribution of the city of Paris to the expenses of the		
tion Service		51,003
ant to the Pasteur Institute for the preparation of diphtheria		
or the city		15,000
nicipal bathing establishments : working expenses only ..		631,000
Total		12,824,178.11

5. *Sewage Disposal Services.*

		Francs
lial establishment :		
Proportionate share of the service in the annual payments on general loans		5,516,671.33
rking expenses :		
Share of the expenses of the technical staff		1,965,495
Upkeep and cleaning of sewers		7,494,375
Cleaning of the Seine, purification and utilisation of sewage water		5,314,375
Share of the cost of pensions and relief		1,395,400
Share in the expenditure of engineering offices ..		790
Share in the expenditure on material		6,858,080
Carried forward		23,230,811.33

Brought forward . . . .

Upkeep and cleaning of sewers : material and operations . . . . . .

Cleaning of the Seine, purification and utilisation of sewage water : material and operation . . . . . .

Dredging of the Seine . . . . . .

Proportionate share in the expenditure of the Water Department . . . . . .

Proportionate share in the cost of the work done by third parties . . . . . .

Proportionate share in the water-rate . . . . . .

Proportionate share in cost of lighting . . . . . .

Proportionate share in annual payment for conveyance of residual waters to sewers and for cleaning sewers and branch pipes . . . . . .

Improvements :

Construction of branches of municipal sewers . .

Sewerage and water-conduit works executed with the assistance of private persons . . . . . .

Protection against floods . . . . . .

Total . . . . . .

(e) APPROPRIATIONS FOR THE HEALTH SERVICE OF THE PREFECTURE OF POLICE.

Health committees of the 20 districts *(arrondissements)* of Paris : staff and equipment . . . . . .

Disposal of dead animals found floating in the river in Paris . .

Sanitary inspection of furnished lodgings (this service also deals with furnished lodgings in suburban communes) . . . . .

Sanitary dispensary (prostitution) . . . . . .

Municipal chemical laboratory . . . . . .

Department for the prevention of fraud and inspection of weights and measures . . . . . .

Infant welfare (service of the Department of the Seine) . . . .

Health Council of the Department of the Seine ; staff and equipment) . . . . . .

Epidemic service and inspection of the technical health services of the Prefecture of Police . . . . . .

Inspection of private hospitals, lying-in hospitals and homes for weaned children : departmental service . . . . . .

Toxicological laboratory . . . . . .

Inspection of establishments classified as dangerous, unhealthy and difficult occupations : departmental service . . . .

Sanitary veterinary inspection (departmental service) :

1 director, 6 assistant-directors, 40 veterinary surgeons, 44 veterinary overseers : staff and equipment . . . .

Total . . . . . .

II. HEALTH LEGISLATION.

npaign against Social Diseases.

Allocation of Sums derived from the Club Tax to Anti-tubercular, Anti-cancer i-venereal Institutions.—Decree dated June 18th, 1925, appointing a Commis- ached to the Ministry of Labour and Health, to give its opinion on the alloca- ums derived from the proceeds of the Club Tax to anti-tubercular, anti-cancer i-venereal institutions.

Article 1.

proceeds of the 40 per cent levy on the funds derived from the Club Tax for tion, enlargement and alteration of anti-tubercular, anti-cancer and anti- institutions shall be distributed according to the directions of a Commission t the Ministry of Labour, Health, Public Assistance and Social Welfare, which osed as follows :

The Minister for Labour, Health, Public Assistance and Social Welfare, President.

A Vice-President.

Eight Members of Parliament.

Two technical sanitary advisers attached to the Ministry of Labour, Health, Public Assistance and Social Welfare.

The Director of the Public Assistance and Social Welfare Department at the Ministry of Labour, Health, Public Assistance and Social Welfare.

The Director of the National Office of Social Hygiene and a member of the Governing Body of the Office.

The Head of the Central Service of General Inspection of the Administrative Services at the Ministry of the Interior.

An Inspector-General or a Deputy-Inspector-General of the Administrative Services at the Ministry of the Interior.

A representative of the Ministry of Finance.

Two members of the National Central Council of Public Health.

Two members of the Permanent Commission for the Prevention of Tuberculosis.

Two members of the Commission for the Prophylaxis of Venereal Diseases.

Two members of the Cancer Commission.

ead of Section at the Offices of the Public Assistance and Social Welfare ent will act as Secretary to the Commission.

Article 2.

Minister for Labour, Health, Public Assistance and Social Welfare shall be ble for the execution of the present decree.

rees dated August 11th and December 5th, 1925, supplementing the preceding nd providing that five members be added to the Commission :

1. The Director of the Public Office of Social Hygiene (Préfecture de la Seine).

2. The Director-General of the Administration of Public Assistance in Paris.

3. A president of an Administrative Commission from a Fren
4. An architect.
5. An inspector-general of the Administrative Services.

(b) *Campaign against Tuberculosis.*—Article 198 of the Finance Law da 13th, 1925, provides for an annual allowance of 5,000 francs for the benefit culous persons receiving a 100 per cent pension on condition that they gi work and are treated under the supervision of the organisations for the prev tuberculosis.

A decree dated August 25th, 1925, lays down the conditions for the appli this article.

(c) *Campaign against Venereal Diseases.*—An international Agreement w at Brussels in 1925. According to this Agreement, seamen will be entitled t treatment on board and also to continue their treatment in the ports on lan text in *Bulletin de l'Office international d'hygiène publique*, No. 10, October 1

Further, on August 22nd, 1925, the Ministry of Labour, Health, Publ tance and Social Welfare sent to the Prefects a circular informing them tha in concert with the Sub-Secretariat of the Ports of the Mercantile Marine and I his administration had decided to furnish free of charge to doctors on French r ships specific anti-syphilitic remedies at present not contained in the ships' n chests.

This would enable ships' doctors to treat seamen, crews and necessitou gers suffering from syphilis immediately and by the most modern methods.

The circular requests ships' doctors to inform the heads of anti-venerea saries in the ports of their Department that applications either by doctors o merchant ships or by the chief doctors attached to French shipping compa a supply of medicaments, must be complied with.

Only the medicaments supplied by the Administration free of charge venereal dispensaries may be issued. The medicaments in question are the fo

Billon's Novarsenobenzol.
Corbière's Novarsenobenzol.
Saca's Metarsenobenzol.
Sulfarsenol.
Acetylarsan and Rhondarsan.
Treparsenan and Neotreparsenan.
Sulfotreparsenan.
Galyl.
Eparsenol.
Hectine and Hectargyre.
Stovarsol.
Luatol.
Trepol and Neotrepol.
Quinio-Bismuth or Quinby.
Muthanol.
Sigmuth.
Spirillan.
Curaluès.
Rubyl.
Ercé's Iodo-Bismuth.
B.I.A.
Enesol.
Robert and Carrière's Gray Oil.
Gambeol.
Various compounds of Mercury.

(d) *Campaign against Cancer.*—Circular from the Minister for Labour, He Social Welfare dated May 13th, 1925, reminding Prefects of the necessity of su regional anti-cancer centres with the necessary funds for carrying on and ex their work, and concerning the cost of treatment of patients at these centres.

The circular is worded as follows :

"Grants towards initial expenditure have been made to some organisations out of the funds of the *pari mutuel* and a supply of rad

been distributed out of the appropriation of 5 million francs voted by Parliament in December 1923.

" The working of the regional anti-cancer centres, although based upon certain regulations common to all, differs with regard to certain administrative points, as some depend for their funds on a Faculty of Medicine or on a Public Office of Social Hygiene, whereas others are independent.

Pending the establishment of these centres upon a definite legal basis, their method of administration should be unified as far as possible.

" 1. Payments to the regional anti-cancer centres for the cost of patients given free medical treatment.

" The daily charge for patients treated at the regional centres will be fixed in accordance with the proposals put forward by the directors of these establishments and subject to the conditions provided for in Article 24 of the Law dated July 15th, 1893. In this way, the expenditure will be borne by the three bodies in the proportions indicated on the scales annexed to that law.

" 2. Payments to the regional anti-cancer centres for the cost of patients who do not receive free medical treatment.

" Patients who are not admitted for treatment free of charge will pay their own daily fee. As, however, in the majority of cases, the daily fee will be higher than that fixed for hospitals, the financial position of each patient concerned may be taken into account, and part of this expenditure be borne by the community.

" The National Central Health Council shall therefore be requested to enter upon its budget a special appropriation intended to make up that portion of the expenditure which cannot be borne by patients of small means.

" This method of procedure, which draws as little as possible upon public funds, will enable the regional anti-cancer centres to develop normally and to adapt themselves to all the requirements of scientific research and the consultation service.

" Each governing body should also allocate an annual grant to the anti-cancer centre of the area in order that the latter may be sure of possessing regular funds for the scientific research work which is of such importance to the race."

mpaign against Infectious Diseases.

on the proposal of the Academy of Medicine and of the National Central Council, paratyphoid fever has been added to the list of notifiable diseases leading 1, by a decree dated January 1st, 1925.

rther instructions concerning the prophylactic measures to be taken in the each of the compulsorily notifiable infectious diseases have been drawn up by ional Central Health Council.

nisterial Circular dated May 11th, 1925, concerning the working of the service notification of infectious diseases.

is circular, addressed to the Prefects, points out to the Councils of the depart- and municipalities and the Prefects the urgent necessity for an improved of the infectious diseases notification service. An examination of the figures d by sifting the notifications provided for in paragraph 1 of the decree dated y 10th, 1903, shows that doctors sometimes fail to realise the object and value formality. The circular points out that the notification of avoidable diseases

and causes of death, if carried out systematically, would form a valuable weap campaign against social diseases. It also shows that if practitioners reali immediately upon receipt of their notifications, the disinfection of the quarters by patients takes place automatically, and that measures may at once be take be for the purification of the water supply, the removal of refuse or the adap premises—in fact, if the authorities and the local councils combined their make the importance of the notification service more clearly understood would realise the value of the formality, and real progress would be recorded.

Ministerial Circular dated June 6th, 1925, addressed to the Prefects co the introduction into France of foreign anti-smallpox vaccines.

This circular points out that certain essential provisions of the decr December 2nd, 1922, regulating the introduction into France of foreign anti- vaccines were being evaded both by consignors and consignees.

Samples taken by the Customs and examined by the Chief Vaccine at the Academy of Medicine were found to be very weak and consequently yield only a negligible percentage of successful results. Worse still the labels tubes of vaccine indicated that they could be utilised within a period months, whereas the period within which vaccines must be used is fixed a days dating from the day of manufacture (Article 2 of the decree). Further, showed that many consignees were not authorised to store anti-smallpox va

In view of the serious consequences which such practices might have fo health, the circular lays stress upon the duty ot the Prefects to exercise activ vision over any stocks of foreign vaccines which may exist in their r departments, and to see that all the provisions of the decree are strictly car

This circular also insists that any measures which may be necessary taken in conformity with the laws and regulations concerning the control of pha more especially as regards the seizure of the products and the closing of th

Ministerial Circular dated June 22nd, 1925, addressed to the Prefects co the supervision of drainage plant called " septic tanks ", following upon submitted to the National Central Health Council and approved by that bo meeting on May 18th, 1925.

As the result of recommendations made by the Health Councils of variou ments, a decision has been adopted in some departments prohibiting any ne lation of purifying sewerage plant known as " septic tanks ".

This decision was adopted because this plant did not fulfil the conditions by the general regulations in force (which only required the previous approv type of plant in accordance with the orders of the Prefect of Police issued in June 1st, 1910).

In practice, these regulations, were systematically evaded by owners and

Owners considered the question solely from the economic point of v builders, after obtaining the necessary certificate, delivered to the owners pl uniform type, but did not trouble to investigate how or where the plant w installed. A large number of septic tanks were not even provided with n arrangements. They thus became merely decantation pits, with most disadvantages and dangers of the ordinary cesspool.

To prohibit septic tanks in France categorically would only have had t of driving owners to adopting the system of cesspools, and would have involv dangers to public health.

Cesspools are condemned by all hygienists. The sides, which ar completely waterproof, allow liquids to ooze through into springs and w

inate the water; moreover, the process of emptying is often dangerous and unpleasant and expensive.

lay down suitable regulations, therefore, appeared more expedient than to t the use of septic tanks.

hen the matter was laid before the National Central Health Council, the latter, nsidering the work of a special Committee which it had appointed at its meeting 18th, 1925, adopted special regulations providing for :

Draft instructions concerning the installation and control of septic purifying nd similar plant ;

A standard municipal decree laying down the conditions for installation, thod of employment and the supervision of such plant.

ntrol of Foodstuffs.

ee Chapter IV, 3.)

cupational Hygiene.

ee Chapter IV, 4.)

III. CAMPAIGN AGAINST SOCIAL DISEASES.

mpaign against Tuberculosis.

Appropriations in the State Budget :

	1925 Francs	1924 Francs
cial hygiene dispensaries, bacteriological labo-s, Grancher and other institutions .. .. ut of this sum, 760,000 francs were allocated to laboratories.)	7,000,000	
undation of public sanatoria	8,310,000	5,000,000
intenance of patients sent to sanatoria ..	4,500,000	4,000,000
Total	19,810,000	9,000,000

Anti-tubercular Organisation.—The number of sanatoria existing in 1924 proximately 110, of which 18 were public; 14 were private sanatoria placed on me footing as the public establishments ; and 78 were purely private.

1925, the number of sanatoria was reduced to 85 by the abolition of a large r of establishments at Berck-sur-Mer, the situation of which it had not then ossible to investigate and which had therefore been considered as sanatoria he law dated September 17th, 1919.

iere were, in 1925, 21 public sanatoria ; 18 for cases of pulmonary tuberculosis; rate sanatoria placed on the same footing as the public establishments, 12 of were set aside for cases of pulmonary tuberculosis ; 44 officially approved private ria, 32 of which were reserved for cases of pulmonary tuberculosis.

iese sanatoria have a capacity of 13,479 beds, of which 6,556 are reserved for f pulmonary tuberculosis and 6,923 for tuberculosis of the bones and ganglia. are some 2,000 beds in establishments which have not made the necessary

NATIONAL ANTI-TUBERCULOSIS COMMITTEE

66 *bis*, Rue Notre-Dame-des-Champs, PARIS-VI^e^

Map showing, according to Departments, the Number of Dispens open on December 31st, 1918

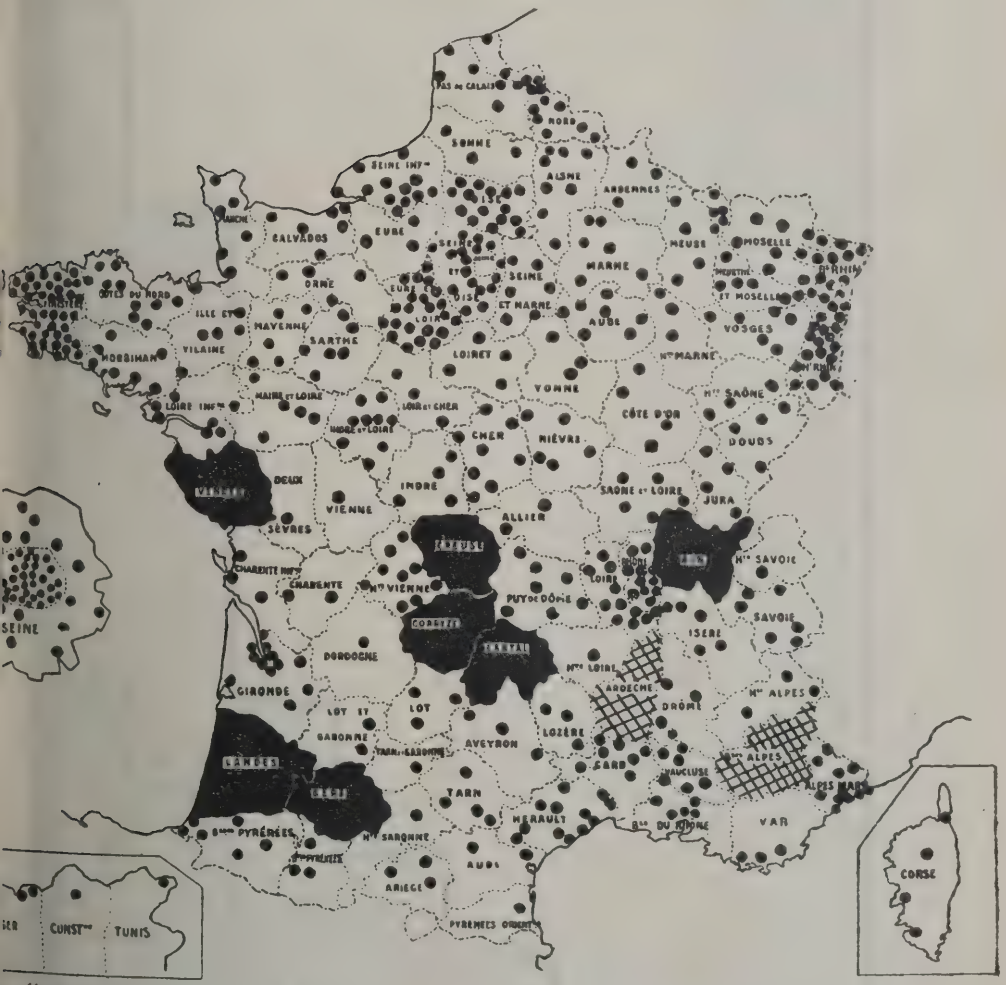
Explanatory note.

- Dispensaries open, distributed over 30 departments (70).
- Departments in which no dispensaries have yet been opened (57).
- Alsace-Lorraine Organisation.

NATIONAL ANTI-TUBERCULOSIS COMMITTEE

66 bis, Rue Notre-Dame-des-Champs, PARIS-VI[e]

showing, according to Departments, the Number of Dispensaries open on December 31st, 1925



dispensaires.
3 dispensaries.

Explanatory note.

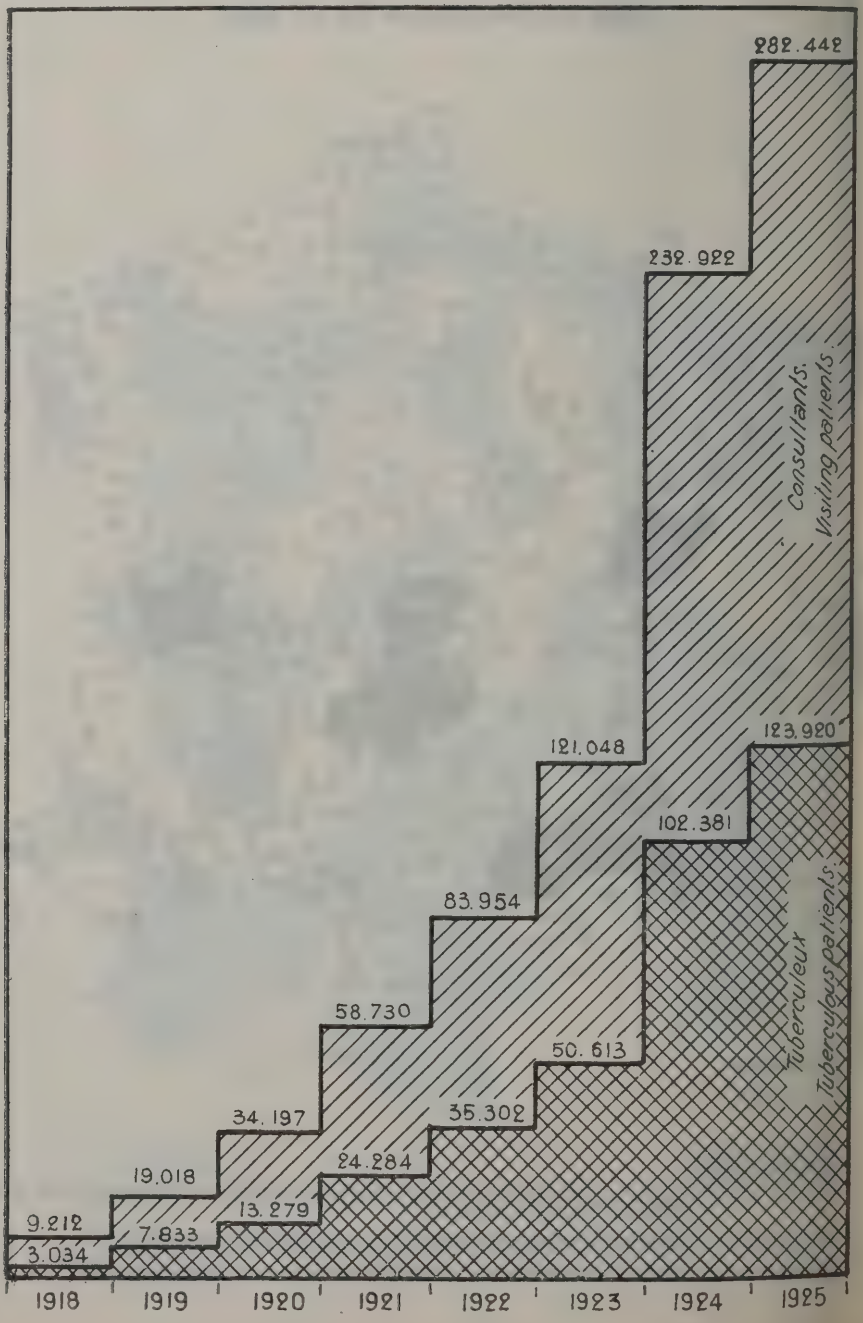
Dispensaries open (569) distributed over 81 departments (included the 8 dispensaries in North Africa).

Departments in which no dispensaries have yet been opened (7).

Departments in which dispensaries are in process of organisation (2).

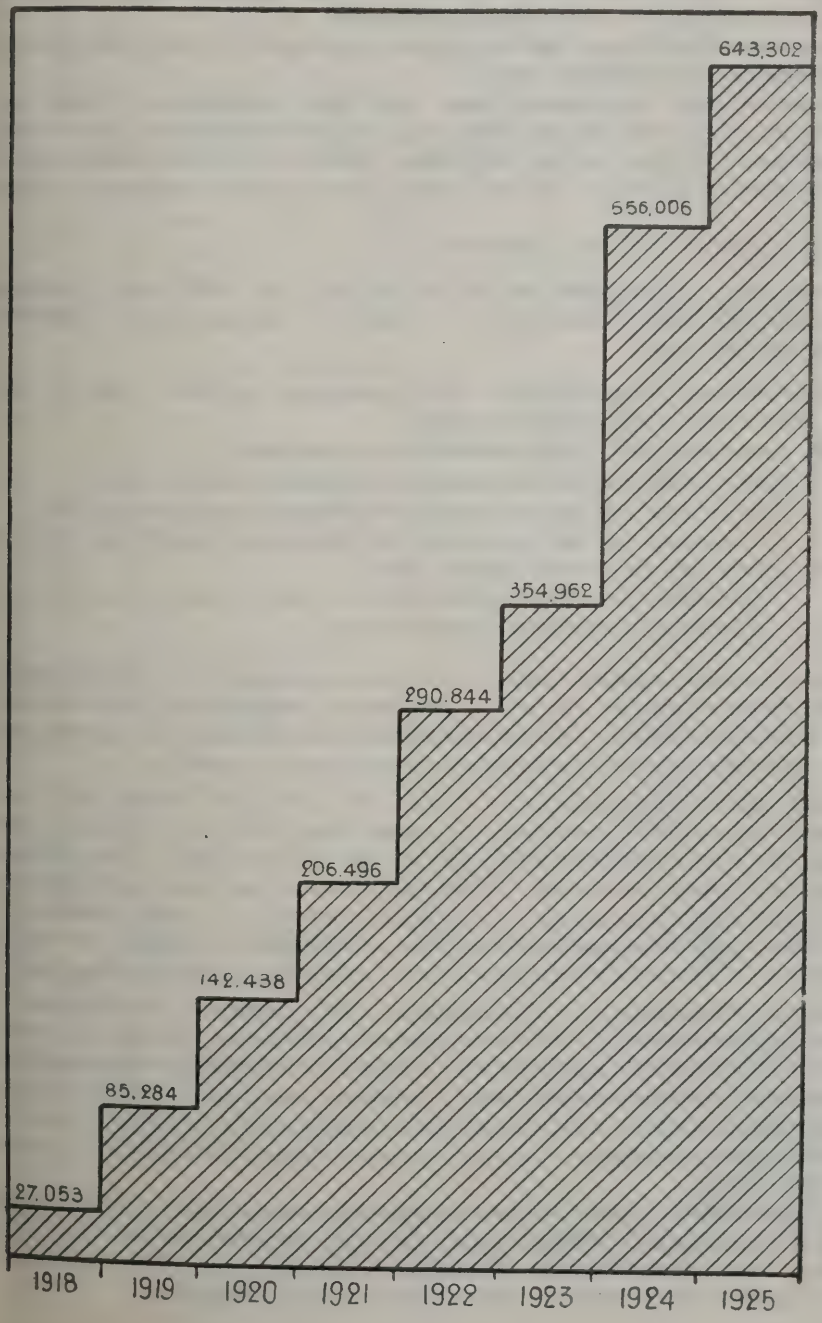
ANTI-TUBERCULOSIS DISPENSARIES

Visiting Patients and Tuberculous Patients treated from 1918 to 1925



ANTI-TUBERCULOSIS DISPENSARIES

Number of Visits paid to Patients at their Homes, from 1918 to 1925.



notification to the Prefecture and have therefore not yet been approved authorities.

No new institutions were opened in 1925, but new wards, comprising 20 were added to the sanatorium at Plougonven (Finisterre).

There are a large number of schemes for the establishment or enlarge sanatoria, 30 of which are now being carried out.

There now exist in France and have been approved by the authorities 103 toria for children, with 10,058 beds.

A number of new dispensaries have also been established. There are r (in 1925) as compared with 528 in 1924, and they are distributed over 81 depa of France proper. At the end of 1925 there were only seven departments i no such dispensaries existed. In two others they are only in process of organ

2. *Campaign against Venereal Diseases.*

(a) *Budgetary Appropriations.*—The budget for 1925 was 5,200,000 including 1,500,000 francs from the Club Tax, as comparedwith 3,040,000 fr 1924, including this tax.

(b) *Anti-venereal Organisation.*—The campaign against venereal disea carried on with great vigour during 1925.

In 1925, there were 472 anti-venereal organisations :

254 centres for the treatment of syphilis (239 in 1924) ;
31 centres for the treatment of blennorrhagia (14 in 1924) ;
81 centres for the treatment of congenital syphilis in pregnant and infants at the breast (45 in 1924) ;
79 centres for the treatment of venereal diseases in prisons.

There are 17 central serological laboratories.

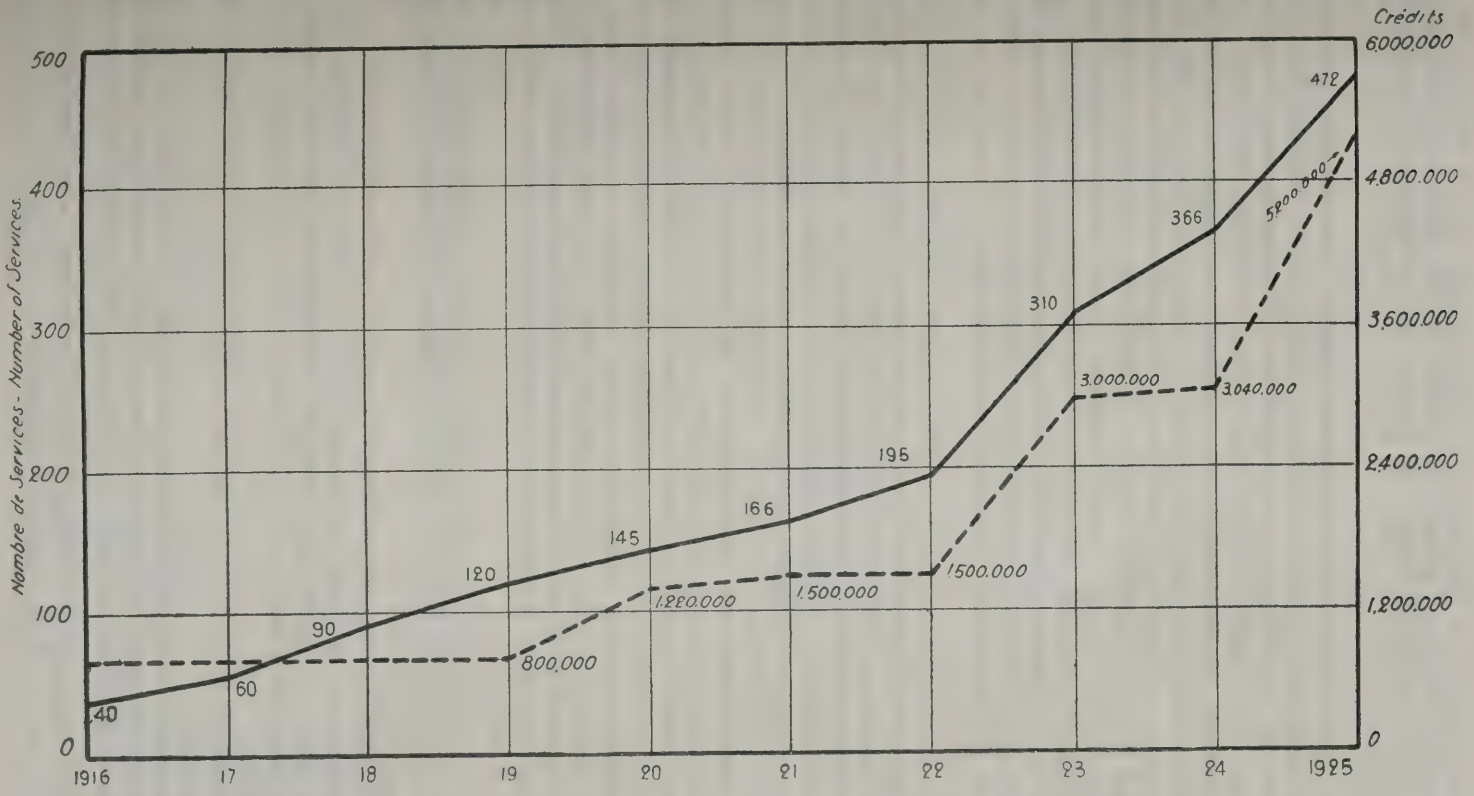
The anti-venereal organisations in the ports are being developed rapidly. have already been organised or are in process of organisation in 51 of the p ports, and comprise centres for the treatment of syphilis, blennorrhagia a services for the detection and treatment of congenital syphilis.

(c) *Anti-syphilis Dispensaries.*—There are now 254 centres for the d and treatment of syphilis, working in connection with the hospitals, social dispensaries, etc., as compared with 239 at the end of 1924. The scheme fo lishing a centre in each town with 10,000 inhabitants and over is being system carried out, and new dispensaries have been opened in a large number of d In many others, new dispensaries have been established to replace the old one were inadequate. Nancy, for instance, now possesses a model dispensary.

(d) *Rural Prophylaxis in Co-operation with Medical Practitioners.*—E results have been obtained by the three control services set up with a view to r venereal patients living in rural districts or small towns with no dispensaries wh only be treated by antiquated methods. Medical practitioners who see these p in their consulting rooms, treat them with medicaments supplied free of ch the authorities, and sometimes even receive some remuneration, are rendering of inestimable value.

In 10 departments (Aisne, Seine-Inférieure, Loiret, Nièvre, Haute-Marne Oise, Gard, Doubs, and Vaucluse) such services adapted to the local condi for instance, the Aisne, Loiret, Meurthe-et-Moselle and Seine-Inférieure already exist and in 15 others they are in process of organisation.

Graph showing the Anti-Venereal Services and the Credits allocated for the Anti-venereal Campaign.



The increase in the appropriations placed at the disposal of the Mini anti-venereal work will make it possible to extend these services to the whole of so that fresh cases of syphilis will become the exception in France, as they alr in Belgium.

(e) *Campaign against Congenital Syphilis.*—Services for the detection an ment of congenital syphilis, so-called " consultations " for pregnant women and at the breast, are of more recent growth. There were only 45 of these at th 1924, but their number in less than a year had increased to 81.

A scheme for attaching such services to all large institutions for the pr of mothers and infants has also been systematically carried out, and at prese are no towns as large as Marseilles or Montpellier where no such organisatio It cannot be said, however, that the anti-syphilis campaign is carried on as vig as it should be in all lying-in hospitals, consultation centres for pregnant and all child-welfare dispensaries. It is well known that each year more tha infants die before or after birth owing to syphilitic infection in the mothe Service hopes that, by administering the funds at its disposal with the utmo it will be able to obtain the best results possible.

(f) *Campaign against Venereal Diseases in the Mercantile Marine.*—An e tion of statistics shows that there is a decrease of syphilis in districts where t no fresh centres of infection (seamen, foreigners), but there has been a slight due to foreign elements, which counterbalances the results of sterilisation am stable population. Special attention is therefore being devoted by the Anti- Service to venereal disease among seamen and foreigners.

The international agreement concerning merchant seamen is already in tion. Only a few very small ports are still unprovided with dispensaries, b will also shortly be properly equipped. More efficient services have been sub for those which were inadequate. There is a model dispensary at Marseil Cherburg and Brest, the casual services have been replaced by first-rate insti

Hitherto, seamen had only received treatment on land. Since Septemb the Minister for Health, in agreement with the Under-Secretary of State f of the Mercantile Marine, has organised treatment on board. This is an im step, and will save many seamen from carrying infection at the critical mo going on shore.

(g) *Campaign against Venereal Diseases among Foreigners.*—Strict m have been adopted to prevent the recrudescence of venereal diseases noticeabl foreigners in France.

The Minister has ordered that a careful watch should be kept over all en and immigrants arriving at Marseilles with a view to detecting all cases of s and bonuses are granted to doctors who discover infected persons. These allowed to land and are treated at Frioul at their own expense or at that of the s companies.

Similar measures, to be applied at all points of entry by sea or land, ar consideration.

Even now no syphilitic foreigners on their way to America who have been at Marseilles remain in France, although highly infectious, because they were embarkation at Marseilles by the American Emigration Service on account of s

(h) *Treatment of Venereal Diseases in Prisons.*—In 79 prisons, any of the i who require it receive regular treatment.

Service for the Prevention of Blennorrhagia.—A great campaign has been ed against blennorrhagia, which is a dangerous disease since it is the cause of ally all cases of involuntary barrenness among women. In more than 31 centres, atic treatment has been organised, and the Service for the Prophylaxis of al Diseases proposes to organise it in all towns with more than 40,000 inhabitants.

Laboratories.—Until the end of 1924, serological tests were only too often ndependently of the supervision of the authorities. In 1925, 17 central sero- laboratories were established. These afford all the necessary guarantees, e attached either to the already existing large laboratories, the Bacteriological te of the Rhone, the Pasteur Institute at Lille, etc., or to the larger syphili- institutions at Nancy, Marseilles, Toulouse, etc.

ıe work already accomplished meets the desires which have long been expressed French syphiligraphists.

) *Sanitary Supervision of Prostitution.*—The Service for the Prophylaxis of al Diseases has continued to supervise the regular organisation of sanitary saries. It has also co-operated with the Committee for the Prophylaxis of al Diseases in preparing a draft law on the reform of sanitary measures in tion with prostitution, the aim of which is to abolish all distinctions between stine and registered prostitutes.

Propaganda.—Active propaganda has been carried on, more especially nine circles, by the Committee for the Education of Women appointed with the al of the Ministry by the Society for Moral and Medical Prophylaxis.

ctures have been given for the first time on the venereal peril to student teachers *écoles normales*. For the first time also, wireless lectures have been given on the subject.

ı) *Conclusion.*—In view of what has already been done, further satisfactory may be anticipated. The eradication of syphilis is primarily a question of . The increased grant of 2 million francs applied for in 1926 is the indispensable um for carrying on the work already undertaken. It was estimated upon a of the strictest economy, and is well below the annual 20 millions for which mmittee for the Prophylaxis of Venereal Diseases has repeatedly applied. figures are very low as compared with the expenditure involved by syphilis. cases of lunacy, 40 per cent are due to syphilis, and lunatics alone cost the nation illion francs a year.

he following tables and graph show the close relation between the number of s and the sums granted, and also the good use to which the latter have been put Prophylactic Service :

ear	Number of Centres	Appropriations Francs
916	40	800,000
917	65	800,000
918	90	800,000
919	120	800,000
920	145	1,220,000
921	166	1,500,000
922	195	1,500,000
923	310	3,000,000
924	366	3,040,000 [1]
925	472	5,200,000 [2]

cluding 40,000 francs from the Club Tax.
cluding 1,500,000 francs from the Club Tax.

To sum up, a very active campaign against the venereal peril in every fo carried on in 1925 ; stringent measures against contracted and congenital and blennorrhagia and special supervision of foreigners and merchant seam introduced.

3. *Campaign against Cancer.*

(a) *Budgetary Appropriations.*—The Government asked for an appro of 1 million francs in the 1926 budget, under " Chapter 88 : Grant for orga expenses of the Regional Anti-Cancer Centres ". There is no appropriation for expenses, but there is one for establishment, to which must be added a further priation from the yield of the Club Tax to an amount not yet determined.

(b) *Regional Centres.*—In 1924, ten regional centres for the anti-cancer ca were approved by the Minister :

Bordeaux,	Nancy,
Toulouse,	Rheims,
Lyons,	Nantes,
Montpellier,	Rennes,
Strasburg,	Angers.

In 1925, regional centres were established at Marseilles and Paris ; the includes six centres for Curie-therapy :

Tenon Hospital,	Necker Hospital,
Hôtel-Dieu,	Lariboisière Hospital,
St. Antoine Hospital,	Salpétrière Hospital.

There is, in addition, the Parisian suburban centre at Villejuif.

IV. PREVENTIVE MEDICINE AND HYGIENE.

1. *National Office of Social Hygiene.*

The National Office of Social Hygiene was created at the suggestion and w financial help of the Rockefeller Foundation, by a Decree dated December 4th and is attached to the Ministry of Labour, Health, Public Assistance and Welfare. Its chief aim is :

(1) To collect and keep up to date all information on the health tion in France ;

(2) To centralise and place at the disposal of the public, nation local services, of the medical profession, of hygienists and of the pu French and foreign documents and all information concerning the l and prophylaxis of social diseases ;

(3) To carry on constant systematic propaganda in France a Colonies with a view to informing the public of the hygienic and p lactic measures necessary for the preservation of health, the eradica social diseases and the preservation of the race ;

(4) To ensure co-operation between public authorities and institutions for the co-ordination of all measures taken to protect the of the public.

ıe methods of work of the National Office of Social Hygiene were fixed by a erial Decree dated January 19th, 1925 (*Official Journal*, January 21st, 1925). ing for the appointment of a governing body and a " Conseil de perfection- t ".

report on the work of the National Office of Public Health during 1925 shows ɔecial attention has been devoted to :

A. The organisation of technical services ;

B. The evolving of a scheme of enquiry in the departments for the purpose of establishing a health schedule *(Bilan sanitaire)* for France and a scheme for the organisation of health work in the departments.

C. The establishment of relations with the public authorities and the principal organisations for the prevention of social diseases (National Committee for Child Welfare, National Committee for the Prevention of Tuberculosis, and the Franco-Anglo-American League against Cancer, etc.).

A. *Organisation of the Technical Services of the Office.*

1. *Organisation of a Service of Information.*

(a) Formation of a library ;

(b) Centralisation of documents concerning public or private social hygiene (original articles, reviews, journals, minutes, congresses, etc.).

(c) Compilation of lists of competent specialists on social health questions ; of public health and relief societies, etc., in France and abroad.

(d) List of model institutions to be visited (now in preparation) ; itineraries for visits and study tours.

he information already collected by the National Committee for Propaganda ɔcial Prophylaxis since its formation will be added to that of the Office.

. *The Organisation of the Propaganda Service* is well advanced, and relations the various National Committees have been established with a view to inating the efforts of propaganda organisations which are at present working ɛndently.

t present, the Propaganda Service of the National Committee for the Prevention ɔerculosis, is responsible for the propaganda work of the Office. It is eminently ied for this work and is carrying on an active campaign not only against tuber- s, but against all the social diseases (so-called " polyvalent " propaganda).

. *Technical Work of the Services of the Office and the Bodies acting in concert with it.*

. *Preparation of a Health Schedule for France.*

(a) Preparation of a general type of questionnaire intended for the enquiry into the organisations dealing with public health and social hygiene in the departments.

(b) Preparation of a questionnaire for special enquiries into social diseases and more especially the protection of mothers and infants.

(c) Preparation of a model chart for each department.

(d) Preparation of standard curves and diagrams relating to health and demography.

(e) Compilation of statistics relating to demography and he each department.

2. *Scheme for the Organisation of Social Hygiene in the Departments.*

A scheme for the campaign against tuberculosis, cancer, alcoholism and is in course of preparation.

Model schemes for the organisation in the departments of :

Social Hygiene ;
Protection of Mothers and Infants ;
An Anti-Venereal Campaign ;
School Hygiene and the Medical Inspection of Schools.

Information on the establishment and working of the health offices and inspection services in the departments is to be brought up to date, in order to fa their practical organisation according to a uniform scheme and to ensure their w on the same lines.

3. *Enquiries in the Departments.*

The National Office of Social Hygiene, with a view to fulfilling its pr object, which consists of drawing up as accurately as possible a record of the situation in France, either with the help of qualified persons acting on the spo sending skilled experts to the departments, has already collected information f departments ; the enquiry has not yet been completed in 46 departments, but th will be finished in the course of the year.

A special enquiry into the protection of children in the Department of the is being conducted.

C. *Establishment of Relations between Private Institutions, National Commit and Public Authorities.*

Contact has already been established with the public authorities, the n and international associations and private persons dealing with social hygi relief, in particular with :

1. The following National Committees :
   The National Committee for the Protection of Childhood ;
   The National Committee for Tuberculosis ;
   The National League against the Venereal Peril ;
   The Anglo-Franco-American League against Cancer ;
   The National Anti-Slum League ;
   The National French League against Alcoholism ;
   The National Committee for Open-Air Treatment.
2. The following International Organisations :
   The League of Nations ;
   The International Society of Public Medicine ;
   The International Labour Office ;
   The Rockefeller Foundation ;
   The Red Cross Leagues.
3. Private associations and institutions.

Public health officers who took part in the international exchanges, in met at the Office, where they reported on the information collected during

and its possible application in France for the improvement of our social health ations.

ıder the patronage and with the assistance of the Office, these medical officers th will also give lectures on social hygiene in their own and in neighbouring nents.

.e Office attaches particular value to the information to be exchanged with ·fects, and through them with the authorities of the departments. A large · of Prefects have already sent favourable replies expressing their intention ying to the Office after the vacation for the instructions and support necessary establishment of social health institutions in their respective departments.

.e Office is also strongly urging upon the Prefects the necessity of organising forcing the service of health inspection in the departments, which is the ıry basis of social health work, and of obtaining permission from the Advisory ls *(conseils généraux)* to organise a service of visiting nurses specially trained ial health work, without which the campaign would be ineffective.

The Women's Health Services in the Liberated Areas ", the credits for which een withdrawn in consequence of the considerable reduction in the appropria- nder this head, have been attached to the National Office of Social Hygiene the name of " Central Section for Trained Nurses ", and will continue under ction to work for the protection of public health and to carry a knowledge of matters to French homes.

blic Office of Social Hygiene of the Department of the Seine.

1924, the number of the Office's dispensaries was 41 ; the Office created and stered 2 temporary stations and acted in concert with 13 private dispensaries ollowed its methods and accepted its advice.

the end of 1925, the number of dispensaries was the same : 20 in Paris, 21 in ıurbs.

ıere are 13 private dispensaries acting in co-operation with the Office, 5 in dis- ıot served by the Office and 8 in districts which are so served.

ɔreover, the social service of the dispensary for the protection of mothers and at 64 Rue Desnouettes has been undertaken by the Public Office of Social ıe, and a dispensary for anti-syphilitic prophylaxis has been established on the es of the tuberculosis dispensary at Suresnes.

ıe number of patients attending the dispensaries of the Office increased from on December 31th, 1924, to 51,999 on December 31st, 1925.

ıe number of cases diagnosed has increased in the same proportion as the r of infectious cases, as will be seen from the following table :

	Cases diagnosed as tuberculous			Infectious cases		
	Adults	Children	Total	Adults	Children	Total
ıber 31st, 1924	16,641	8,826	25,467	7,119	129	7,248
ıber 31st, 1925	19,333	10,259	29,592	8,680	168	8,848

he number of visits to patients at their homes during 1925 amounted to an ge of 15,500 per month, which is approximately 186,000 per annum.

here were 177,301 individual consultations (medical, radiological or laryngoco-) in 1925, during 12,918 consultation times.

The number of days of treatment of patients at the establishments of th in 1925 amounted to :

433,498 for children ;
273,334 for adults ;
318,928 for patients placed in families or homes ;

a total of .. .. 1,025,760 days of attendance.

The credits voted for 1925 by the Conseil général of the Seine to meet the expenses of the Public Office of Social Hygiene amounted to 14,574,085 fran

3. *Control of Foodstuffs.*

During 1925, several new administrative regulations concerning wine, syru liqueurs, sweetmeats and confectionery were added to the legislation on com fraud and adulteration.

The Decree of August 15th, 1925, concerning wine and amending the De August 19th, 1921, provided that dry white wines should not be sweetened wit which had previously been sugared ; but its main object was to lay down as stri as possible the rule that labels must show the percentage of alcohol. Under t ceding decree, only retail establishments were required to show the percentage provision has already proved its use by producing a decrease in the adultera wine by watering, but the necessity for laying down that producers and wh merchants must also indicate the percentage when sending consignments to r was obvious. The percentage must be shown on bottles and on casks. Win under the name of the vintage are alone exempt from this formality.

A Circular Letter from the Ministry of Agriculture dated September 1st gave to the officials responsible for the suppression of fraud useful instructions application of the new regulations.

The Decree of September 16th, 1925, concerning syrups and li supplementing the Decree of July 28th, 1908, added more detailed instructions particularly in regard to the definition of black-currant liqueur and syrup.

Another Decree, dated September 16th, 1925, concerning sweetmeat confectionery gave a fuller definition of " refined sugar " and laid down more str conditions concerning these products than the regulations of December 19th, 1910 previous regulations left a chance of fraud in the case of jam *i.e.*, giving the n a particular fruit (apricot, for example) on a label without mentioning less costly used in the manufacture. In future, when the manufacturer adds any other fruit, or apple juice, or a vegetable acid juice obtained from the apple, this m recorded on the label (*e.g.*, " Apricot and Apple ").

Further, a special Law dated July 26th, 1925, defines Roquefort cheese, must be manufactured exclusively from ewes' milk and lays down stringent me for preventing fraud with respect to this product.

Finally, several important circulars concerning the question of hygiene in stuffs were addressed, during 1925, by the Ministry of Agriculture to officials or l tories responsible for the prevention of fraud. The chief of these were :

The Circular dated July 22nd, 1925, recommending that the directors of laboratories should devote particular attention to the suppression of adulterat milk with water, however slight, and a Circular dated September 14th, 1925, add to inspectors for the suppression of fraud, concerning the application of the dated June 28th, 1912, referring to syphon tops, which, according to the Decree not contain more than 10 per cent of lead.

tructions sent on June 7th, 1925, to the Directors of the Laboratory of the ıry Service at Alfort, abolishing the permission granted during the war (decision anuary 6th, 1917) to import from the United States of America salt pork d by ordinary pickling followed by rubbing over with sea-salt containing boric spite of the use of the antiseptic.

e Service, which is attached to the Ministry of Agriculture, comprises about local officials of the departments and municipal officials who act under the ı of a superior staff of 65 inspectors, appointed by the Ministry. Control is l by taking samples in the manner prescribed by the regulations concerning re dated January 22nd, 1919. The samples are sent to the Regional ories, and, where fraud is suspected, the matter is laid before the legal ies and experts on both sides are called to give an opinion.

e following table gives statistics concerning the measures taken during 1925, ws the legal results of these measures.

L STATISTICS OF WORK DONE DURING 1925 THROUGHOUT THE TERRITORY.

ıre of Samples taken	Samples sent to the laboratory	Samples recognised as suspect	Percentage	Infringements reported	Known judicial results			
					Convictions	Without result	Case dismissed	Acquital
cluding samples for rison)	16,707	4,367	26.1	436	1,985	322	446	148
ıts, oils	2,877	1,060	36.8	262	577	52	23	17
xcluding samples for ison)	5,346	2,152	40.2	656	1,047	158	143	69
cider	468	31	6.6	6	10	5	1	2
nd spirits	2,159	1,467	67.9	29	885	38	23	13
syrups and lemonades	1,124	540	48	23	243	28	25	8
chers' products, tinned	875	528	60.3	30	374	16	13	3
a, chicory	2,054	616	29	45	413	25	11	14
ocolate, sugar	558	52	9.3	13	18	2	1	—
.. ..	903	82	9	9	42	4	—	1
stry, macaroni, etc. ..	1,356	249	18.3	62	112	32	20	2
nd spices	523	39	7.4	52	35	19	7	4
s and extracts	514	19	3.6	1	9	2	3	—
oil-cakes	334	177	52.9	1	128	10	—	2
s	757	83	10.9	9	18	25	11	6
eous	328	67	20.4	21	19	11	11	2
Totals	3,435	711	20.7	1,236	1,006	121	366	121
	40,318	12,240	30.3	2,891	6,921	870	1,104	412

rge number of sentences of imprisonment were passed.

total amount of fines in 1925 amounted to 1,651,559 francs. Fiscal fines he same period amounted to 31,546,954 francs.

upational Hygiene.

ing 1925, the Ministry of Labour has been unremitting in its efforts to increase ection afforded to the health and lives of persons employed in the industrial mercial concerns.

egard to legislation an important reform has been effected. The International Conference, at its third session at Geneva, had adopted a draft International

Convention concerning the use of white lead in the painting trade. Articles 7
of Book II of the Labour Code were amended by the Law of January 31st,
accordance with the principles laid down in the draft International Convention
at Geneva completing the system of protection of workers which the Law of J
1909, now forming part of the Code, had instituted in France as regards th
white lead in house-painting.

Two amendments were added to the original regulations :

(a) Sulphate of lead and all products containing sulphate of l
added to the list of those the use of which was prohibited by the forme
79 ;

(b) The prohibition of the use of harmful products will be a
henceforward not only to work done by house-painters but also
carried out by the employers or owners themselves.

The application of the Law of October 25th, 1919, extending to diseases of
tional origin the application of the Law of April 9th, 1898, on accidents incurr
course of employment is at present applicable only to affections produced by
of lead or mercury a list of which is included in the schedules annexed to the La
Ministry of Labour is now considering whether there are any further diseas
should be included in these tables.

In regard to regulations, the Ministry of Labour has endeavoured to b
existing provisions for the protection of children and women against lead poiso
conformity with the recommendation on that subject adopted by the Inte
Labour Conference at Washington. For this purpose, it has prepared a draf
amending the Decree of March 21st, 1914, on occupations dangerous to chil
women. Further, the Labour Inspection Service is now holding an enquiry
conditions under which the regulations in force concerning occupational hyg
applicable to establishments in which workers are exposed to infection from

As a result of the enquiry into health conditions in the kitchens of restaur
hotels, and after a meeting of a mixed committee of the representative
employers' associations and trade unions of the occupations concerned, useful
tions have been addressed to the Labour Inspection Service concerning measur
improvement of health conditions in these establishments.

Finally, the preparation of the Administrative Regulations provided fo
Law of August 5th, 1917, concerning the suckling of infants by mothers in i
and commercial establishments has been completed and a draft Regulation
submitted to the Council of State.

As regards safety, reference should be made to the following :

(a) Promulgation of the Decree dated August 9th, 1925, co
the special measures for protection and safety to be taken in builde
and on public works ;

(b) The preparation of a preliminary draft of a decree concernin
measures of protection applicable to the work of loading and unloa
handling in ports ;

(c) The investigations were being conducted with a view to the
of the Decree of October 1st, 1913, concerning the protection of w
establishments using electric power. The object of this revision is
the provisions of the Decree of October 1st, 1913, to the technical
which have taken place in establishments using electric power.

* * *

he matter of hygiene and safety, the Ministry of Labour has followed the which has been employed in regard to other aspects of the regulation of labour. thod is to ask for the assistance of those concerned, particularly of employers' ons and trade unions, in enforcing the existing regulations and in preparing s. This system, based on voluntary acceptance and active assistance, appears had much better and more lasting results than could have been obtained by uthoritative and coercive action.

*
* *

tly, in connection with the length of the working day—a question which, quite unconnected with those of hygiene and safety, affects the well-being of kers to at least an equal degree—a number of decrees have been promulgated he last few months to secure the application of the Law of April 23rd, 1919, on t-hour day. These decrees affect the following industries :

Large railway systems of general concern (personnel other than engine-drivers, firemen and guards) ;

Glass works of all kinds, excepting automatic mirror and glass works ;

Butchers' shops in the town of Lyons and various neighbouring communes ;

Chemical industries ;

Undertakings for the manufacture of plaster, lime and cement, and quarries connected with these undertakings ;

Hotels, cafés, restaurants and other establishments for the sale of foodstuffs to be consumed on the premises in the town of Lyons and various neighbouring communes ;

Hotels, cafés, restaurants and other establishments for the sale of foodstuffs to be consumed on the premises in the town of Bordeaux and various neighbouring communes ;

Toy trade and lesser industries in wood and similar materials ;

Biscuit works, chocolate works and confectionery ;

Manufacture of jewellery, goldsmiths' work, clock works, and art and immitation bronze ;

Marble works and statuary ;

Wood industries other than furniture, toy trade and lesser industries in wood and similar material.

gust 1926.

GERMANY

. Development of the Population from 1910 to 1925.
ty and Mortality in the Years 1923 to 1925 in Germany

BY

Dr. E. ROESLE (Berlin).

B. Public Health Development during 1925

BY

Professor Bernard MÖLLERS (Berlin).

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By Dr. E. Roesle,

Member of the Health Office of the Reich, Berlin.

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evelopment of the Population from 1910 to 1925. Natality and Mortality in the Years 1923 to 1925 in Germany.

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I. DEVELOPMENT OF THE POPULATION.

ording to the final results of the census taken in the German Reich (excluding Territory) on June 16th, 1925[1], the figure of the population actually present 564,753, and that of the "habitually" resident population 62,248,782. no census of the habitually resident population had previously been taken, increase in the population of Germany can only be calculated on the basis gures of the population actually present. In 1910 (December 1st), there were 00 persons in the territory now belonging to the German Reich, so that up ear 1925 there was an increase of 4,766,000. The increase during these 14 ½ as only slightly greater than that of the previous period of five years between uses of 1905 and 1910 (4,284,504), and of this increase only a little more than d was of the male sex, the figures being 1,693,000 for males and 3,073,000 for

atural consequence of this unequal increase in the population was a big rise xcess of women, as shown by the following table giving the distribution of the pulation according to sex :

Year	Population actually present		Excess of Female Population over Male	
	Male	Female	Number	Per 1,000 Males
	Population of the German Reich (Territory of 1925)			
. .. .	30,182,563	32,383,190	2,199,627	1,073
. .. .	28,489,787	29,308,552	818,765	1,029
in 1925 as compared h 1910	+ 1,692,776	+ 3,073,638	+ 1,380,862	+ 44

hough the classification of the 1925 population according to ages has not yet mpleted, it may be assumed that the increase in the excess of women, namely, 2, is composed principally of persons born in the years 1880 to 1899, *i.e.*,

[1] *Wirtschaft und Statistik*, published by the Statistical Office of the Reich, 5th Year (1925), page 783, and 6th Year e 292.

those from 26 to 45 years of age in 1925, as it was, of course, the male portio group that was much more heavily depleted by the war. So far the onl available are those for the Free State of Bremen[1], which show that the su males between the ages of 26 and 40 in 1910 had been converted in the y to a very considerable female surplus, the figures for persons between these 1910 being 941 women to 1,000 men, and in 1925 1,186 women to 1,000 me present decline in the birth rate can be better understood when it is conside the number of women of child-bearing age is nearly one-fifth greater than the of men of the same period of age.

The war and its consequences have had an unfavourable influence not the distribution of the German population according to age but also on its dist according to *civil status*. The last census of the population shows that, in the number of widows and widowers had risen from 374,918 in 1910 to 41 1925, making an increase of 10 per cent, while the number of divorced persons sexes rose from 8,997 to 24,138 during the same period, making an increase per cent. Although it may be presumed that this latter increase has been ever in the Protestant States of Germany than in Bavaria, this factor is neverth small numerically to provide an adequate explanation of the present decreas birth rate.

In 1925, Germany contained only 63,580 *communes*, as against 75,939 in Germany's territory at that date. This decrease is chiefly due to cessions of t as a result of the war, though in a less degree to the amalgamation of small co with their larger neighbours.

Of the 63,580 communes in Germany in 1925, 60,132 were *rural* commu less than 2,000 inhabitants ; their population was 22,224,945, or 35.6 per cen total population. The largest section of the population, amounting to 37.7 p is now to be found in the communes of between 2,000 and 100,000 inhabita the remainder, 26.7 per cent, in the large towns of over 100,000 inhabita compared with 1910, there has thus been a movement of the population tow large towns, whose figure is the only one that has increased—from 21.3 to cent, while that of the rural population has fallen from 40 to 35.6 per cent a of the communes of between 2,000 and 100,000 inhabitants from 38.7 to 37.7 p The decrease in the rural population was not, as in previous periods, a purely tional one but an actual one, and is due chiefly to the fact that the proportio rural population in the ceded territories was much higher than in the territori remained. The actual decrease in the rural population and the fact that the in population is confined to the large towns must also be regarded as factor have contributed to the decline in the birth rate, for the large towns show the birth rate.

While the *area* of Germany was 13.05 per cent smaller in 1925 than in 191 to cessions of territory, the *density of the population* rose by 11.4 per cent du same period, the figures being 133.7 per square kilometer in 1925, as comp 120.0 in 1910, in the territory of Germany as it then was. This serious relative re in the food supply is not only a consequence of the increase in the pop but is also due to the fact that the population of the ceded territories was les than that of the territory retained.

As in other densely populated countries, the increasing limitation in t supply has been accompanied in Germany by a decrease of the birth rate.

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[1] *Wirtschaft und Statistik*, 6th Year (1926), page 200.

II. NATALITY.

eral Birth Rate.

contrast to nearly all the other Western European countries, the German birth ıre, after its sharp fall in 1922 and 1923, only diminished to a trifling extent and in 1925 it even *rose* slightly.

Live Births in Germany

Year	Number	Per 1,000 of the Population in the Middle of Each Year
1923	1,297,449	21.0
1924	1,270,820	20.5
1925	1,290,732	20.6

small variation in these figures seems to indicate that the German birth rate e 1923 stopped at a minimum figure, which is, however, appreciably higher e minimum figure attained at the same period by a number of other Western ın countries (Sweden, Esthonia, England, France, Switzerland, Belgium and h Free State).

he eleven largest German States, *i.e.*, States with more than 500,000 inhabitants, h rate varied in 1923 between 23.4 in Bavaria and 15.0 in Hamburg, and in aving out of account the actual maximum which was registered by Oldenburg .4) between 22.5 in Bavaria and 15.3 at Hamburg. While, therefore, the m figure again fell, the minimum figure had already begun to rise again, with lt that the differences in birth rate between the various parts of the Reich en diminishing. Apart from Bavaria, as the following table shows, Saxony, ınd Thuringen showed greater falls in 1924 than the other German States:

TABLE I.

GEOGRAPHICAL DISTRIBUTION OF THE BIRTH RATE IN GERMANY IN 1923 AND 1924.

Reich, and larger German s with more than 500,000 Inhabitants	Live Births			
	Number		Per 1,000 of the Population in the Middle of Each Year	
	1923	1924	1923	1924
erman Reich	1,297,449	1,270,820	21.0	20.5
ussia	792,862	784,713	21.0	20.7
varia	172,978	167,400	23.4	22.5
xony	89,060	83,376	18.3	17.1
urtemberg	51,301	49,361	19.6	18.8
den	51,844	49,325	22.4	21.2
uringia	35,557	33,604	22.4	21.0
esse	27,438	27,095	20.3	19.9
amburg	16,007	16,268	15.0	15.3
ecklenburg-Schwerin	15,062	14,787	22.0	21.5
denburg	12,717	12,930	23.0	23.4
unswick	9,504	9,187	19.7	18.3
emaining seven States	23,119	22,774	19.8	1 .4

ional figures, *Wirtschaft and Statistik*, 6th Year (1926), page 402.

The birth rate in 1924 was still to a large degree under the influence of in exactly nine months after the stabilisation of the German currency in D 1923, the birth rate again began to rise, as can be seen from the quarterly fig

Birth Rate (live births) per 1,000 of the Population

Quarter	1923	1924	1925	Increase or Decrease in 1924 compared to 1923	Increase in compare to 1924
I. .	22.9	21.6	21.8	— 1,3	+ 0.2
II. .	21.9	20.6	21.8	— 1.3	+ 1.2
III. .	19.9	19.6	19.9	— 0.3	+ 0.3
IV. .	19.0	20.0	19.0	+ 1.0	— 1.0

The *recovery* in the German birth rate thus began in the fourth quarter and continued until the third quarter of 1925. In the large towns with mo 100,000 inhabitants, there was a relapse in the birth rate in the fourth qu 1925, which became more marked in the first and the second quarter of 1926, co with the aggravation in the economic crisis towards the end of 1925.

2. *Vitality of New-Born Infants.*

While the number of live-births in Germany in 1924 was 26,629 less tha previous year, the number of *still-births* somewhat increased. The figure ro 42,705 in 1923 to 42,805 in 1924, and 43,579 in 1925. This increase was s however, that the proportion of still-births to the population remained the all three years, viz., 0.7 per 1,000 inhabitants. This increase, however, rai proportion of still-births to the total number of registered births, which w in 1923, 3.26 in 1924, and 3.27 in 1925 per 100 births (live births and still-birt bined). Whether this increase was accompanied by a simultaneous increase number of abortions is a question which it is difficult to decide, the only argu favour of this supposition being the considerable increase in the number of from puerperal fever throughout Germany and particularly in the towns. statistics on the *frequency of abortions* are obtainable only from two large t Central Germany—Halle and Magdeburg, where an endeavour was made to as far as possible all cases of abortion treated by midwives, doctors and ho As, owing to their rareness, these statistics should be of general interest, the p data are given in Table 2.

TABLE 2.

RATE, STILL-BIRTHS AND PREMATURE BIRTHS IN MAGDEBURG IN 1913-24 AND IN HALLE IN 1920-23.

Mean population in thousands	Per 1,000 of the Average Population				Per 100 Conceptions (Column 6)			Number of Abortions per 100 duly Notified Births (Cols. 3 and 4)
	Live Births	Still-births	Abortions notified	Total Number of Conceptions (Total of Cols. 3 and 4)	Live Births	Still-births	Abortions	
2	3	4	5	6	7		9	10
Town of *Magdeburg* (including non-residents) [1]								
292	20.6	0.78	4.3	25.7	80.2	3.0	16.8	20.1
298	14.1	0.65	6.2	21.0	66.9	3.1	30.0	42.4
Town of *Halle* (including non-residents) [2]								
192.5	25.3	0.97	4.6	30.9	81.9	3.1	15.0	17.6
194.2	24.3	1.21	4.4	30.0	81.2	4.0	14.8	17.4
195.4	22.0	1.02	5.1	28.1	78.2	3.6	18.1	22.2
195.5	20.3	0.95	4.6	25.8	78.6	3.7	17.7	21.5

ESLE : "Die Magdeburger Fehlgeburtenstatistik vom Jahre 1924", *Archiv für Soziale Hygiene und Demogra-*
eries, Vol. I, 1926, pages 189-195.
ated according to the figures of H. WOLFF : "Zur Beobachting der Fehlgeburten", *Allgemeines Statistisches*
14, 1925.

will be seen from these detailed figures, the question of the survival of new-
ants has quite another significance if it is measured not only on the basis of
ortion of still-births but on the basis of the number of still-births and abortions
d. The latter total amounted in Magdeburg in 1924 to exactly one-third
er cent—and in Halle during the years 1920-23 to one-fifth—19.9 per cent—
otal number of conceptions ascertained. This low proportion of successful
ons is due, of course, less to biological causes than to the exogenous causes
ve rise to birth control.

hould be pointed out that the increase in the number of abortions notified in
irg in 1924 as compared with 1913 does not necessarily mean that there was
ise in these actual number of abortions, for a much smaller number of doctors
these statistics in 1913 than in 1924. On the other hand, the statistics of
vns show a big decline in the birth rate accompanied by an increase in the
on of still-births.

3. *Legitimate and Illegitimate Births.*

The following figures were registered in the German Reich :

	Years		Incr Dec
	1923	1924	
Legitimate live births .. :	1,163,779	1,138,488	—
Illegitimate live births	133,670	132,332	—
Legitimate still-births	35,959	35,816	—
Illegitimate still-births	6,746	6,989	+
Total	1,340,154	1,313,625	—

These figures show that the above-mentioned increase in still-births is due to the increase in *illegitimate still-births*. The reason for this exceptiona menon seems to be a purely demographical one—the increase in the age of un mothers. It is a well-known fact that the proportion of still-births increa the age of the mother. In the war years 1915-18, in view of the large decrea number of marriages, only a small proportion of the women at that time of n able age got married, and the women who were still single after the war had les tunities of marrying owing to their advanced age ; the result was a modific the average age of single women who became mothers, although only the fi the census of 1925 can confirm this conclusion.

As it is only the number of illegitimate still-births that has increased, the tion between these and the total number of illegitimate births had corresp risen, while the ratio of the legitimate still-births to all legitimate births has r practically unchanged. The proportion of illegitimate still-births had, of already begun to increase in 1919, and has been almost continually rising ev

TABLE 3.

PROPORTION OF LEGITIMATE AND ILLEGITIMATE STILL-BIRTHS IN GERMANY, 1919-24.

Year	Still-births per 100 Live Births and Still-births		Total Still 100 Live Still
	Legitimate	Illegitimate	
1919	2.82	4.34	2.
1920	2.98	4.59	3.
1921	2.96	4.83	3.
1922	3.01	4.95	3.
1923	3.00	4.80	3.
1924	3.05	5.02	3.

igh a proportion of illegitimate still-births as that of 1924, when 5 per cent gitimate births were still-births, has not been seen in Germany since the period 5. The increase in this proportion since the world-war is the more striking lar phenomenon has only been observed hitherto in the single case of Hungary. he above figures of legitimate and illegitimate live-births show, their propor- he increasing figure of the population further diminished in 1924. In that number of legitimate live births per 1,000 of the population was 18.3 and the of illegitimate live births 2.1, as against 18.9 and 2.2 in 1923. On the other e relation between illegitimate live births and still-births has changed little. e seen from the following table :

	Illegitimate Live Births per 1,000 Live Births	Illegitimate Still-births per 1,000 Still-births	Illegitimate Births per 1,000 Live Births and Still-births combined
3	103.0	158.0	104.8
4	104.1	163.3	106.1

se proportions vary from one period to another ; during the war, as a result ecrease in the number of marriages, they largely increased, the figure rising in the case of live births in 1918 ; after the war, when the number of marriages its maximum, they again rapidly fell off.

III. MORTALITY.

eral Mortality.

ough the number of deaths in Germany had already fallen very considerably there was a further and much greater drop in 1924 and 1925, and the mortality ouched a new record, considerably below the lowest record of before the war. l number of deaths fell from 857,898 in 1923 to 759,075 in 1924, making a of 98,823 in a single year, the corresponding fall per 1,000 of the population m 13.90 to 12.22. This fall continued in 1925, in which year the proportion v 12—to be exact, to 11.9—the actual number of deaths further decreasing 06.

he eleven larger German States, only one, Oldenburg, had a death rate under 23 ; in 1924 the number had risen to 4, namely (in addition to Oldenburg), Hesse and Brunswick. All the German States shared in the fall of the death 924, from which it may be concluded that this decrease was due to general Fuller details with regard to the geographical distribution of mortality will be Table 4 herewith.

TABLE 4.

GENERAL MORTALITY. GEOGRAPHICAL DISTRIBUTION OF MORTALITY IN GE
IN 1923 AND 1924.

German Reich and Larger German States	Total Deaths (excluding Still-births)		
	Number		Per 1,000 of the Popula Middle of Each Y
	1923	1924	1923
German Reich	857,898	759,075	13.90
1. Prussia	522,826	459,046	13.88
2. Bavaria..	111,561	99,958	15.11
3. Saxony	62,221	54,888	12.82
4. Wurtemberg	36,268	32,353	13.87
5. Baden	32,220	29,317	13.94
6. Thuringia	21,482	19,196	13.56
7. Hesse	16,206	15,287	12.02
8. Hamburg	14,129	13,150	13.24
9. Mecklenburg-Schwerin	11,502	9,830	16.79
10. Oldenburg	6,350	5,834	11.59
11. Brunswick	7,029	6,000	14.09
12. Remaining seven States	16,104	14,216	13.76

2. *General and Standard Mortality by Sexes.*

With regard to mortality by sexes, the fall in the death rate was somewha in the case of males than of females, the result being that there was little d between the two figures in 1924. In the latter year, the death rate of the was 12.69, as compared with 11.78 of the female sex. Taking the latter as former amounted to 107.7. Since 1919, when the difference between the s unusually small, this difference is the smallest which the German mortalit have yet shown, and is due to the fact that after the war the fall of male m was greater than that of female mortality. In reality, the difference between sexes was even smaller than appears from a comparison of their crude mortalit

The standard mortality figures for 1923, the earliest year for which cal of this kind can be made, show a relation between the sexes of 100 : 107.1, relation between the crude mortality figures for that year was 100 : 108.5. Th ence between these two proportions indicates that a greater change took pla distribution by age of the male population than in that of the female populat that this change was to the detriment of the male sex. This was the result o losses, which had the effect of raising the proportion of men over 50 years By basing the mortality figures on a common standard, it is, however, to compensate for this change in the distribution of age-groups which exe unfavourable effect on the male mortality.

standard figures also show that the crude mortality figures for the last few dicate a somewhat lower mortality than would be the case if the population any was still divided by age and sex in the same manner as in 1910, the ion of the population in the latter year having been taken as the standard oning the mortality figures.

TABLE 5.

MORTALITY IN GERMANY ACCORDING TO SEX IN 1923 AND 1924.

Year	Total Deaths in Germany					
	Number			Per 1,000 of Population		
	Male	Female	Total	Male	Female	Total
.. ..	430,706	427,192	857,898	14.49	13.35	13.90
.. ..	379,920	379,155	759,075	12.69	11.78	12.22
	Standard Death Rate according to :					
	Standard Distribution of the German Population in 1910			Standard Distribution of the English Population in 1901		
	Male	Female	Total	Male	Female	Total
.. ..	14.61	13.64	14.12	14.35	13.19	13.78

rtality by Age and Sex.

e considerable decrease in the number of deaths in Germany in 1924, amounting t 99,000 as compared with the previous year (in which the figure had already o a new low record), was only due to the extent of one-third to a decrease in among infants in their first year, this decrease being roughly 34,000. At e time, however, there was a fall of about 27,000 in the number of live births. *ant-mortality* rate, nevertheless, considerably decreased—from 132 per 1,000 ths in 1923 to 108 in 1924 and 105 in 1925. The German infant-mortality are thus at last approaching the low figures of the countries of North-West this movement being, however, accompanied by a fall in the birth rate to 1,000 in 1924.

much greater importance is the fall of 65,000 in the age-groups above 1 year as the mortality figures of nearly all these groups have since 1921 been below before the war. Unfortunately, the mortality figures by age-groups for 1924 yet available, but it may be concluded, from a comparison between the fre- of different causes of death in 1923 and 1924, that the fall in the mortality has been considerable between the ages of 1 and 5, in the adult groups between s of 20 and 40 and in the more advanced age-groups.

Table 6.

MORTALITY IN GERMANY BY AGE AND SEX IN 1923.

(a) *By Age-Groups of 5 Years.*

Age-Groups	Total Deaths				
	Number			Per 1,000 Persons of the Same Sex	
	Male	Female	Total	Male	Female
0– 1	96,520	74,496	171,016	144.1 [1]	118.7 [1]
1– 5	26,322	23,866	50,188	11.4	10.7
0– 5	122,842	98,362	221,204	41.8	34.8
5–10	5,163	4,747	9,910	2.3	2.1
10–15	5,658	5,735	11,393	1.7	1.8
15–20	12,395	10,549	22,944	3.8	3.2
20–25	17,450	13,989	31,439	5.9	4.5
25–30	12,008	14,063	26,071	5.3	5.0
30–35	9,798	12,755	22,553	4.9	5.1
35–40	10,652	12,889	23,541	5.5	5.7
40–45	12,695	13,040	25,735	6.8	6.4
45–50	16,515	15,667	32,182	9.1	8.2
50–55	19,742	17,482	37,224	13.1	11.2
55–60	24,747	21,898	46,645	19.9	16.4
60–65	30,615	28,656	59,271	31.6	26.2
65–70	33,414	35,019	68,433	49.6	43.1
70–75	36,816	42,508	79,324	82.7	74.0
75–80	30,206	38,717	68,923	133.9	124.3
80–85	20,386	26,852	47,238	213.9	196.1
85–90	7,717	11,218	18,935	326.6	306.0
90 years and upwards ..	1,653	2,933	4,586	371.1	389.1
Age unknown ..	234	113	347	—	—
Total ..	430,706	427,192	857,898	14.49	13.35

[1] Calculated per 1,000 live births.

(b) *By Age-Groups of 10 Years from 30 Years of Age upwards.*

Age-Groups	Number of Deaths per 1,000 Persons of the Same Age	
	Male	Female
30–40	5.2	5.4
40–50	7.9	7.3
50–60	16.2	14.9
60–70	39.0	33.4
70–80	99.9	91.7
80–90	236.1	218.7
90 years and upwards	371.1	389.1

According to the English Age-Groups from 25 Years of Age upwards.

Age-Groups	Number of Deaths per 1,000 Persons of the Same Age and Sex	
	Male	Female
. .. .	5.1	5.1
. .. .	6.2	6.1
. .. .	10.9	9.5
. .. .	25.0	20.8
. .. .	60.9	55.9
. .. .	157.6	146.0
s and upwards	334.6	314.5

ble 6 gives very detailed *mortality figures by age and sex* for 1923, which makes ble to establish comparisons with those of other countries. Attention should n to a special characteristic of the male mortality figures, *i.e.*, that the number hs was higher in the age-groups from 20 to 25 and from 25 to 30 than in the ups from 30 to 35 and from 35 to 40. The same remark applies to the proporat exists between the death rates of the age-groups of 20 to 25 and 25 to 30 at of the age-group of 30 to 35. This phenomenon—from the physiological f view surprising—has been repeated in every year since the war ; the reason ssible to ascertain, as the German statistics include the causes of death of all between the ages of 15 and 30 in a single group. It is supposed, however, e estimated number of living persons in these age-groups is not quite accurate, this point cannot be settled until the results of the census of 1925 are forth-. In the case of females, who showed a smaller mortality than males in every up except those from 10 to 15, 30 to 35, 35 to 40 and 90 upwards, this phenodoes not occur.

asonal Variations of Mortality.

hile before the war the monthly movement of the mortality figures was charac- by a culminating point in winter and by a more or less marked culminating n summer, during the war the summer increase began gradually to disappear. crease was almost exclusively the consequence of the rise in infant mortality the hot season. In 1924, however, it was entirely absent and there was a onding fall in the infant mortality during that year. Instead, we find a seainimum of mortality occurring in the months from August to October.
1924, the winter mortality increase was also much less marked, as there was no change in the temperature. This explains the sharp decrease in mortality diseases of the respiratory organs, tuberculosis and senile debility. It must be recognised that the low mortality figures for 1924 were almost exclusively the favourable weather conditions ; for the greatest decrease occurred in the and summer months, during which meteorological conditions have the greatest ce on mortality. As these conditions were also very favourable in both the and the summer months of 1925, it is clear that the mortality figures for this so were low.

TABLE 7.

SEASONAL DISTRIBUTION OF MORTALITY IN GERMANY.

(a) *For Each Month in* 1923 *and* 1924.

Month	Total Deaths			
	Number		Per 1,000 of the Popul culated on the Basis of	
	1923	1924	1923	
January	87,299	74,732	16.69	1
February	82,064	68,618	17.37	1
March	87,078	76,996	16.64	1
April	75,962	69,014	14.99	1
May	71,613	64,703	13.67	1
June	64,364	56,895	12.69	1
July	69,014	57,043	13.16	1
August	62,679	56,869	11.95	1
September	62,709	53,366	12.35	1
October	61,894	56,865	11.79	1
November	61,943	59,123	12.19	1
December	71,279	64,851	13.57	1
Total	857,898	759,075	13.90	1

(b) *By Quarters in* 1925.

Quarters	Total Deaths according to the Provisional Quarterly	
	Number	Per 1,000 of the Pop culated on the Basis o
I	196,276	12.75
II	186,429	12.09
III	171,476	10.98
IV	190,125	12.15

IV. CAUSES OF DEATH.

The year 1924 is the first for which the German statistics of the causes include the whole territory of the Reich; in that year, the small Free State lenburg-Strelitz—with a population of not quite 100,000 inhabitants and exceeding 10,000 inhabitants—which had hitherto compiled no statistics of t decided to do so. As hitherto, these statistics were compiled on the basis of Abbreviated German List of Causes of Death, which enumerates either forms o of diseases, the latter, however, being incomplete. These statistics can

ed with those of other countries in the case of certain individual forms of disease. ever, the mode of ascertaining the cause of death varies in the different German rom the primitive method, that of questioning the relatives of the deceased, nost exact method of certification by the doctor treating the case and by the ng medical officer responsible for checking the latter's report, it is clear that lts of these statistics in the various German States are of very different value, t the accuracy of the figures for the whole Reich is problematical, particularly classification of the data regarding the causes of death is not carried out in ne way in all the States. An approximately reliable basis of comparison is pplied by the figures regarding infectious diseases, but even here the heading rculosis of Other Organs " is influenced by the different methods employed taining the causes of death.

ectious Diseases.

the statistical data regarding the causes of death, special interest attaches e relating to notifiable diseases, as these figures supply the most reliable test roportion of cases of these diseases which are declared. The relation between nber of deaths attributed to these diseases in the statistics of the causes of nd the number of notified cases of the same diseases gives the following *case* figures for the whole of Germany in 1924.

Notifiable Disease	Cases notified	Number of Deaths recorded in the Statistics of Causes of Deaths	Number of Deaths per 100 Cases notified (Case Fatality)
eria	38,256	3,624[1]	9.5
fever	33,739	750	2.2
l fever	14,439	1,891	13.2
al fever	6,935	3,628	52.3
ery	5,845	684	11.7
ic cerebro-spinal meningitis	749	457	61.0
oliomyelitis	507	103	20.3
x	123	23	18.7
ox	16	6	37.5
fever	8	1	12.5

[1] ding the deaths from croup.

ile neither the frequency nor the mortality of these diseases seems to be sub- ny limit, the case fatality seems to be more or less constant, such fluctuations are being inherent in the nature of the different diseases. It may be presumed other countries in which cases of disease and fatal cases are noted with the curacy, the case fatality must be approximately the same ; any considerable ncy would mean either that the statistics were incomplete or that the disease ject to regional variations. The following table contains a comparison of the ality of a number of important notifiable diseases in two countries in 1924, glish figures having been calculated in the same way as the German.

Table 8.

COMPARISON OF THE MORBIDITY, MORTALITY AND CASE FATALITY OF CERTAIN INF DISEASES IN GERMANY AND ENGLAND IN 1924.

Notifiable Disease	Cases notified per 10,000 Inhabitants		Deaths ascertained per 10,000 Inhabitants		Number of D per 100 Ca
	Germany	England	Germany	England	Germany
Diphtheria ..	6.18	10.83	0.6	0.6	9.5
Scarlet fever ..	5.45	21.85	0.1	0.2	2.2
Typhoid fever ..	2.33	1.06	0.3	0.1	13.2
Puerperal fever ..	52.78 [1]	29.90 [2]	27.6 [1]	13.9 [2]	54.3
Cerebro-spinal meningitis ..	0.12	0.10	0.07	0.08	61.0
Acute poliomyelitis	0.08	0.20	0.02	0.04	20.3
Smallpox	0.004	0.97	0.001	0.003	37.5

[1] Per 10,000 live births and still-births.
[2] Per 10,000 live births.

While the mortality rates of *diphtheria* are the same in both countries, a considerable difference between the morbidity rates and also between the rates, from which we must conclude that the German morbidity rate is inc as the fatality rate is much too high. The mortality due to *scarlet fever* in was twice as large as in Germany, from which one would expect a morbidity twice as large as in Germany ; the latter, however, is four times as large in as in Germany, which provides further ground for suspicion that the German m rate is incomplete.. On the other hand, the mortality, morbidity and fatali due to *typhoid fever* are all greater in Germany than in England, which seem respond to the reality, as this is one of the diseases for which it is easiest t full statistics. The opposite is the case with regard to *puerperal fever*, as the tion of statistics on this disease *post abortum* is a matter of considerable di Nevertheless, the fatality rates of both countries are more or less in agreemer rates for *cerebro-spinal meningitis* also bear each other out, both as regards n and as regards morbidity and fatality, particularly if one takes into account that the latter is based on very small absolute figures which are therefore su certain fluctuations. While the fatality rates of *acute poliomyelitis* are the both countries, the mortality and morbidity rates are twice as large in Englar rates for *smallpox* show the greatest difference between the two countries as morbidity and case fatality, which points to the fact that this disease has a p character in England, the reasons for which have not yet been ascertained however, the number of cases and deaths in Germany, as already pointed out, small, the case fatality calculated on the basis of these figures is not of very gre

It may further be remarked that, in 1924, the mortality rates of the followi tious diseases reached a new low record in the German statistics of causes of d

Cause of Death	Deaths per 10,000 of the Population in 1924 (minimum since the commencement of the record)
Smallpox	0.001
Scarlet fever	0.1
Erysipelas	0.2
Measles and German measles	0.3
Diphtheria and croup	0.6
Tuberculosis (all forms)	12.0

ost significant is the fall in tuberculosis, the mortality rates of which had agair 1922 and 1923, the rate in the latter year being 15. This temporary increasn y be due to an increase in the case fatality, the inevitable consequence of which fall in the mortality rate, as many consumptives succumbed prematurely in nd 1923.

mours.

cording to the German classification of causes of death, only carcinoma is l separately ; all other tumours, whether malignant or otherwise, including s of the female sexual organs, are classified under the single heading " Other rs ", opposite to the classification in the international nomenclature.

a consequence of the increasing average age of the German population since , *i.e.*, of the growing proportion of the population over 50 years of age, the ty due to carcinoma has rapidly and continually risen, namely, from 8.1 in 9.8 in 1924, or an increase of 21 per cent. That this increase is due only to in the average age of the population and not to the improvement in the state- f causes of death—in which respect no change has occurred since the war— n by the difference in the rate of increase in the two sexes. The mortality Germany was as follows :

Year	Mortality due to Carcinoma per 10,000 Living Persons		
	Male	Female	Both Sexes
	7.3	8.9	8.1
	9.0	10.5	9.8
age increase	+ 23	+ 18	+ 21

, owing to war losses, the average age of the male sex has risen more than that emale sex, there is no difficulty in accounting for the greater increase in the mor- ate of carcinoma as regards the former. If the cause was an improvement nethods of ascertaining the causes of death, the increase would have been the or the both sexes.

the other hand, the mortality due to " Other Tumours " in the years 1922 to as remained the same, as the changes in the distribution of the population by little influence in these figures.

ganic Diseases.

nong the organic diseases, those affecting the *respiratory* and *digestive organs* l new low records in 1924. This, of course, was chiefly due to the smaller number

of children and to the considerable fall in infant mortality. While mortality
diseases of the circulatory organs, which is numerically the largest group, hardl
ged, the mortality caused by *apoplexy* once more reached its previous maximur
per 10,000 of the population. The lowest recorded rate from this cause wa
1918, 1920 and 1921—as a consequence of the large decrease in the consum
alcohol during the years of the war. In 1923, the inflation year, the rate was
as low, namely 5.9, although in the previous year, 1922, it had risen as high

The mortality due to *appendicitis*, which before the war was remarkable
regular rate of 0.6 per 10,000 every year, and which had fallen during and a
war, returned in 1924 to its pre-war level for the first time. This pheno
for which there is a parallel in the case of other diseases—such as diabetes, for e
—seems to have some connection with changes in the diet of the populatio

4. *Puerperal Diseases.*

The mortality due to puerperal diseases in Germany attained consi
dimensions both during and since the war.

In 1924, the mortality due to *puerperal fever* reached a figure which has on
exceeded in 1920 and 1923. The total number of deaths registered as due
disease amounted to 3,628 in 1924, of which 2,108 occurred in towns of over
inhabitants. The relation of this figure to the number of births in 1924 was as f

	Live Births and Still-births (taken together)	Deaths due to Puerperal F	
		Number	Per 10,0 Live Bir and Still-b
German Reich	1,313,625	3,628	27.6
Towns of 15,000 inhabitants and over (urban population)	456,635	2,108	46.2
Localities with less than 15,000 inhabitants (rural population)	856,990	1,520	17.7

The reason for the great difference between the figures for the urban ar
populations only becomes apparent if the deaths from puerperal fever are divic
those occurring *post partum* and those occurring *post abortum*, but this can
done for the cases occurring in the urban population. Of the 2,108 deaths re
in the town population, 949 occurred *post partum* and 1,159 *post abortum*. Lo
it is only the former figure that can be compared with the registered number o
and this gives a proportion of 20.8 deaths per 10,000 live births and still-birth
figure is not far from that of 17.7 recorded for the rural population, and is
only higher than the latter because it includes the deaths of non-residents, who
belong to the rural population. This does not mean, however, that no dea
to puerperal fever *post abortum* occurred among the rural population. In P
in which, in 1923, a record of all deaths due to this cause was kept, it was fou
out of 538 deaths due to puerperal fever in the rural communes (in the admini
sense), at least 117, *i.e.*, one-fifth (21.7 per cent) were *post-abortum* cases ; on th
hand, a similar calculation for all German localities with a population of over
in 1924, gave a proportion of nearly three-fifths (55 per cent). It may be co
that, of the 1,520 above-mentioned cases occurring in localities of less than

[1] *Medizinalstatistische Nachrichten*, 13th Year (1926), Part III, page 111.

ınts, at least 330 must have been *post abortum*, so that the total number of such
Germany in 1924 would amount to 1,489, as compared with 2,139 *post-partum*
The latter figure corresponds to a mortality rate of 16.3 per 10,000 births, which
lower than that calculated on the basis of the total number of deaths due to
ral fever.
ese particulars show the difficulty not only of calculating the mortality rate
rperal fever but also of securing comparable ratios. Such a comparison will
impossible as long as the following ratios are not established in the different
es :

$$\frac{\text{Total number of deaths from puerperal fever}}{\text{Number of conceptions.}}$$

$$\frac{\text{Deaths from puerperal fever post partum}}{\text{Number of live births and still-births (or, better, deliveries).}}$$

$$\frac{\text{Deaths from puerperal fever post abortum}}{\text{Number of abortions.}}$$

l the other calculations usually made (ratio to the total population, to the female
tion, to the total number of deaths, etc.) cannot, of course, give any comparable
. At present, the German statistics of the causes of death do not allow any
above three ratios to be determined, although the second can be calculated
urban population since 1923. This last remark only applies to a single other
y, namely, Switzerland, where these figures are available both for the urban
e rural populations.
rangely enough, the mortality due to the other puerperal diseases increased
the war in exactly the same way as the mortality due to puerperal fever and
art from considerable temporary variations, remained at a high level since the

Deaths due to Violent Causes.—While the mortality due to accidents was
n 1924 than in any previous year, suicides reached the same high rate as in
his phenomenon is an economic one and is due to the stabilisation of the German
cy and the collapse of many businesses created during the period of inflation.

V. INFANT MORTALITY.

s already mentioned, a considerable fall in the mortality of children under 1 year
took place in Germany in 1924 and 1925, the figures being 131.8 per 1,000 live
in 1923 ; 108.0 in 1924, and 105.0 in 1925. This can, of course, be attributed
ny causes, but at present they cannot be verified, as all the necessary details
t forthcoming. On this point we must therefore be content for the moment
he detailed figures for 1923.

1. *Mortality by Months of Age.*

The following table shows the relation in 1923 between the total number o in the different months of the first year of age compared to the number of live

TABLE 9.

INFANT MORTALITY IN GERMANY IN 1923 BY MONTHS OF AGE AND BY SEX.

Months of Age	Deaths under 1 Year of Age				
	Number			Per 1,000 Live Births	
	Male	Female	Total	Male	Female
0– 1	36,648	27,224	63,872	54.7	43.4
1– 2	10,352	7,532	17,884	15.5	12.0
2– 3	9,042	6,733	15,775	13.5	10.7
3– 4	7,500	5,792	13,292	11.2	9.2
4– 5	5,996	4,616	10,612	8.9	7.4
5– 6	5,126	4,051	9,177	7.7	6.5
6– 7	4,608	3,769	8,377	6.9	6.0
7– 8	4,083	3,458	7,541	6.1	5.5
8– 9	3,830	3,271	7,101	5.7	5.2
9–10	3,570	2,973	6,543	5.3	4.7
10–11	3,071	2,691	5,762	4.6	4.3
11–12	2,694	2,386	5,080	4.0	3.8
0–12	96,520	74,496	171,016	144.1	118.7

The high mortality among infants under 1 year of age in Germany has h been chiefly due to the mortality of the first month. In 1923 also, nearly on of all deaths occurring in the first year took place in the first month. In this too, the fall in the mortality rate was lower. As, since 1913, the probabil living one month from each month of age have been calculated, the variations mortality rates of the different months of age can be accurately ascertained. parison with 1923 shows, for example, that in that year the decrease in the mo was largest in the second to sixth months and smallest in the first month, the being as follows :

GERMAN REICH.

Month of Age	Index of the Mortality Rate in 1923, taking the Corresponding Rate for 1913 as 100	
	Boys	Girls
.. ..	96.3	96.2
.. ..	79.8	77.7
.. ..	79.8	77.2
.. ..	78.7	78.8
.. ..	75.9	76.4
.. ..	79.1	77.7
.. ..	81.4	79.2
.. ..	80.4	80.8
.. ..	83.1	81.3
.. ..	87.5	79.1
.. ..	83.6	82.1
.. ..	82.9	80.4
.. ..	86.5	85.1

ısonal Variations in Mortality of Legitimate and Illegitimate Children under ıe Year.

Germany, there has always been a considerable difference between the mor- of legitimate and illegitimate children, and this difference was further accen- in the years after the war, for it is only the mortality of legitimate children as fallen as compared with the pre-war period. The difference between these ortality rates in the years 1912 and 1913 and in the years 1922 and 1923 was ows :

ear	Mortality of Children under 1 Year of Age per 1,000 Legitimate and Illegitimate Live Births		
	Legitimate	Illegitimate	Difference
912	139	232	+ 93
913	142	237	+ 95
922	117	236	+ 119
923	120	236	+ 116

his difference in the mortality rates is the more surprising as the relief organisa- ay special attention to illegitimate children and are mainly at work in the towns, the number of illegitimate children is largest. Nor can the fall in the mortality timate children be regarded as due to the efforts of these organisations, for this ion is already explained by the considerable falling-off in the number of fourth, tc., children of a family, whose mortality is well known to be much greater than f first, second and third children.

n the other hand, it may be concluded from the monthly mortality figures that fluence of the seasons is practically the same on the mortality rate of legitimate

and illegitimate children. As will be seen in Table 10, the relative difference
the mortality figures of legitimate and illegitimate children in 1923 was the
nearly every month, although in the months with the highest and lowest figu
difference was somewhat smaller than that between the yearly mortality
Taking the mortality of legitimate children as 100, the proportion between
was 100 : 197, while the monthly difference was 100 : 190 in March (winter ma
mortality) and 100 : 193 in September (summer maximum of mortality) and
(minimum of mortality). It will therefore be seen that infant mortality is
to external influences much more powerful than those exercised by human insti

TABLE 10.

SEASONAL VARIATIONS IN THE MORTALITY OF LEGITIMATE AND ILLEGITIMATE CH
IN GERMANY IN 1923.

Month	Deaths under 1 Year of Age					
	Number			Per 1,000 Live Births of the same C during Same Month and 11 Previous calculated on the Basis of 1 Y		
	Legitimate	Illegitimate	Total	Legitimate	Illegitimate	T
January . .	13,146	3,183	16,329	124.6	253.7	1
February	13,789	3,117	16,906	145.4	276.0	1
March	15,235	3,454	18,689	145.4	276.8	1
April	11,658	2,764	14,422	115.8	230.8	1
May	11,301	2,538	13,839	109.2	207.3	1
June	9,424	2,135	11,559	94.8	182.8	1
July	11,060	2,386	13,446	108.6	201.0	1
August	11,472	2,552	14,024	113.6	217.7	1
September	12,671	2,793	15,464	130.5	247.8	1
October . .	10,756	2,386	13,142	107.7	206.1	1
November	9,095	2,128	11,223	94.8	192.4	1
December	9,803	2,170	11,973	99.2	191.1	1
Total . .	139,410	31,606	171,016	119.8	236.4	1

3. *Principal Causes of Death among Infants under 1 Year of Age.*

Although the diagnoses of the causes of death among infants are of d
value owing to the variety of sources from which they come in the different G
States, they at least provide some indication of the measures to be taken to c
infant mortality and of how to ascertain the effects of these measures. As a
mentioned, the fall in infant mortality in Germany up to 1923 was small an
confined to legitimate children. The statistics of the causes of death now m
possible to determine which causes contributed to this reduction and which did

The *congenital* causes of death are, of course, the most difficult to combat
therefore no matter for surprise that these show the least reduction. They hav
become the most important since it has been possible to reduce the former high
of mortality due to enteritis. Of 171,016 deaths under 1 year of age, 51,292, or

d, come under the heading "Congenital Debility and Malformations" in For every 1,000 births, there seem to have been 39.61 deaths due to these n the latter year, as compared to 37.04 in 1913. Nor is any reduction apparent nortality figures of congenital syphilis, which since the war have continually d. In 1923, 1,392 deaths of infants under 1 year of age were registered as his cause, a figure which is even greater than that of the deaths due to tuber- of the respiratory organs.

rdly more progress has been made in combating *infectious diseases* among The following table shows the mortality rate of children under 1 year of n infectious diseases in Germany per 1,000 live births :

Diseases	1913	1923	Increase or Decrease in 1923 compared to 1913
asles and German measles ..	2.26	2.12	— 0.14
rlet fever	0.23	0.06	— 0.17
ooping-cough	4.25	3.51	— 0.74
phtheria	0.68	0.63	— 0.05
luenza	0.18	2.30	+ 2.12
berculosis (all forms)	1.76	1.88	+ 0.12
ysipelas	0.29	0.30	+ 0.01
ner infectious diseases caused by vounding	0.50	0.93	+ 0.43

e reduction in infant mortality is therefore confined to diseases of the *nervous (convulsions)* and of the *digestive organs*, but, in considering the figures regard- se diseases, it must be remembered that the fluctuations in meteorological ons in different years exercise a considerable influence.

e reduction in mortality due to enteritis was, however, so considerable that it regarded as a consequence of the growing tendency to revert to breast-feeding. uction of the mortality due to enteritis in Germany as compared with the other l groups of diseases was as follows in 1913 and 1923 :

Diseases	Mortality per 1,000 Live Births 1913	1923	Increase or Decrease in 1923 compared to 1913
arrhœa, enteritis, cholera nostras	39.65	22.87	— 16.78
ner diseases of the digestive rgans	1.62	1.88	+ 0.26
eumonia	10.49	14.93	+ 4.44
eases of the nervous system ..	10.28	8.63	— 1.65
eases of the circulatory system	2.49	2.81	+ 0.32
eases of the genito-urinary ystem	0.39	0.52	+ 0.13

conclusion, it should be mentioned that the figures of mortality attributed to n causes have also decreased, from 4.16 in 1913 to 2.33 in 1923 (calculated as This, however, can only be due to the cession of the Eastern Provinces, h these figures were always the highest.

B. Public Health Development during 1925.

By Professor Bernard Möllers (Berlin).

I. BUDGETS FOR 1926.

1. *The Public Health Budget of the Reich.*

In the draft budget of the Reich Ministry of the Interior for the financial ye the estimates are as follows :

General appropriations for *Public Education and Schools.*—For the pro of gymnastics and sport (subsidies to the chief associations of the Reich co with gymnastics, sports and walking excursions ; subsidies granted to repres sports institutions) : 400,000 M. (same amount as in the preceding year).

Encouragement of efforts which aim at the moral improvement of the pop and in particular of young persons, in so far as these efforts are of general imp (encouragement of welfare institutions and associations, particularly of those for the young) : 250,000 M. (same amount as in the preceding year).

Public Health.—Encouragement of work of general importance directed the improvement of health conditions among the people, especially among the and, particularly, welfare work in connection with the health of infants, c and cripples, as well as popular health teaching : 500,000 M. (2,500,000 M. in ceding year).

Reich subsidy for expenditure by Prussia on measures to prevent cattle 200,000 M. (250,000 M.).

Credits for the temperance campaign and the campaign against affectio nected with alcoholism (tuberculosis, venereal diseases, assistance in case of disease and lunacy) : 1,800,000 M. (same amount as in the preceding year).

The ordinary budget of the Reich Ministry of Public Health in respect of and personal and material expenses amounts to : 1,303,083 M. (1,087,120 M. preceding year).

The Budget for 1926 of the Reich Ministry of the Interior provides, un heading of Extraordinary Expenditure on Public Health, the following c

Appropriations for medical research and the prevention of human dis 200,000 M. (200,000 M.).

Subsidy for upkeep of an institute for the reduction of infant mortality many (total amount borne by the Reich and Prussia in the proportion of thre to two-fifths) : 120,000 M. (120,000 M.).

Appropriations for research into and prevention of diseases of animals : 50 (50,000 M.).

The following general appropriations are included in the budget of the *M of Labour* for 1926 for the requirements of social insurance :

Reich subsidies to supplement disablement insurance funds : 192,695, It is estimated that, in 1926, the Reich will have to pay 1,766,900 M. disab pensions and 274,700 M. widowers' and widows' pensions of 72 M. each per and 1,269,400 M. orphans' allowances of 36 M. per annum.

The amount estimated for accident insurance in Government underta 1,150,000 M. In 1924, 4,200 persons were in receipt of accident allowances.

regard to assistance to women in childbirth, the Reich subsidies for 1925 were
ed at 20 million M. The Reich Government asked that these subsidies might
elled in 1926, but the Council of the Reich restored them. The Reich Govern-
n its Bill regarding assistance to women in childbirth, proposed the withdrawal
of the Reich Insurance Code, which makes the Reich responsible for refunding
contributions of sickness insurance funds towards assistance to families.
e contribution of the Reich to the International Labour Office at Geneva is
ed in the budget at 225,000 M., while a credit of 25,000 M. is provided for
ation in the work of this Office.
e sum of 50,000 M. is allocated for the inspection of health and labour condi-
mong the workers.
r 1926, unemployment relief is reduced to 40,000,000 M., as compared with
,000 M. in the previous year, while the amount allocated for productive work
unemployed has been reduced to 60,000,000 M. (as compared with 100,000,000
ie preceding year).
accordance with the decree of February 16th, 1924, regarding assistance to the
oyed, the Reich bears one-half of the cost of such assistance as is not covered
contributions of employers, workers and the communes ; the Reich contribu-
comes due when 3 per cent of the basic wage, which is the maximum contribu.
thorised, has been paid for at least two weeks in one contributing district-
r other social relief measures 12,184,000 M. are set aside (relief of German dis-
ervice men abroad, 400,000 M. ; relief for disabled employers and workers
y in the employment of military or naval works, 11,738,000 M., etc.).
regards State Homes for Pensioners, a sum of 1,070,000 M. is allocated for
nd 235,000 M. for pharmaceutical, surgical and medical supplies.
sum of 50,000 marks is set aside to enable doctors in the Pensions Service
ove their scientific knowledge.
e administrative costs of the central and branch offices for the assessment
yment of supplementary allowances (§§ 88-95 of the Reich Pensions Law of
st, 1925) amount to 3,500,000 M.
e ordinary budget for 1926 of the Reich Ministry of Labour allocates, for the
ie, a sum of 500,000 M. for subsidies to institutions and establishments capable
ting the Reich in carrying out the work of medical relief, for which it is respon-
accordance with §§ 4-9 of the Reich Pensions Law. The reason for these
es is that the medical treatment carried out by the sickness insurance offices
t fully meet the special requirements of those most seriously disabled.
credit of 859,500 M. has been allocated for building alterations and improve-
in medical appliances, on behalf of the medical services connected with the
stration of pensions.
its extraordinary budget, the Reich Ministry of Labour has asked for 15,000,000
the building of houses, the enquiry carried out on October 1st, 1924, in
to housing requirements having shown that the number of Reich officials
ployees of public administrations (including the Army) who were without
amounted to about 18,000.
ie budget of the General Pensions Fund for 1926 allocates 645,000,000 M. for
is to ex-service men. Of this sum, 591.8 million M. are allocated to the old
nd 53.1 millions to the new. Pensions to surviving relatives of ex-service men
t to 780.8 million marks.
r medical treatment to ex-service men and expenditure connected therewith
illion M. are allocated ; 400,000 M. for assistance to men disabled in the war

and not entitled to free medical treatment, and 1.95 million M. to compens
cially hard cases.

The expenditure on pensions provided for under the law of June 30th, 192
ing personal war damages is estimated at 2,345,000 M. per annum. The tot
for military pensions amounts to 1,466,746,000 M.

The budget of the general administration of finance provides 7,500,00
subsidies to secular and religious relief institutions and establishments, and 2,5
for subsidies to establishments and institutions for the promotion of scientific
and research.

For pensioners' insurance, 40,000,000 M. are allocated ; 2,000,000 M.
granting of special assistance to home workers, employees and workers in the
industry; 2,500,000 M. for subsidies to private relief establishments or inst
which contain some 600,000 beds and a staff of more than 100,000 persons.

The sum of 9,000,000 M. is set aside for the construction at the cost of t
of dwellings for officials' employees and workmen belonging to Reich adminis
including service men. This sum may only be employed when it is impossibl
cure the necessary sums for building by means of Reich loans advanced from t
ing funds of the Reich Ministry of Labour. It is estimated that the cons
of 444 dwellings will meet the most urgent requirements.

The ordinary budget of the Ministry for National Defence contains, u
item of " Health ", a credit of 5,358,090 M. for the Army and another of 1,40
for the Navy.

2. *Public Health Budgets of the Larger German Federated States.*

(a) *Prussia.*—Some of the appropriations for the public health service
in the budget of the Ministry for Science, Arts and Public Education, othe
budget of the Ministry for Social Welfare.

The expenditure on the universities and the " Charity Hospital " in
included in the budget of the Ministry for Science, Arts and Public Education.

The total ordinary expenditure for the Prussian universities amounts
million M., as compared with 35.8 million M. in 1925, an increase of nearly
lion M. The additional expenditure is due mainly to increased salaries.
the appropriations for expenditure on material, the upkeep of buildings, exte
libraries, etc., have all had to be increased.

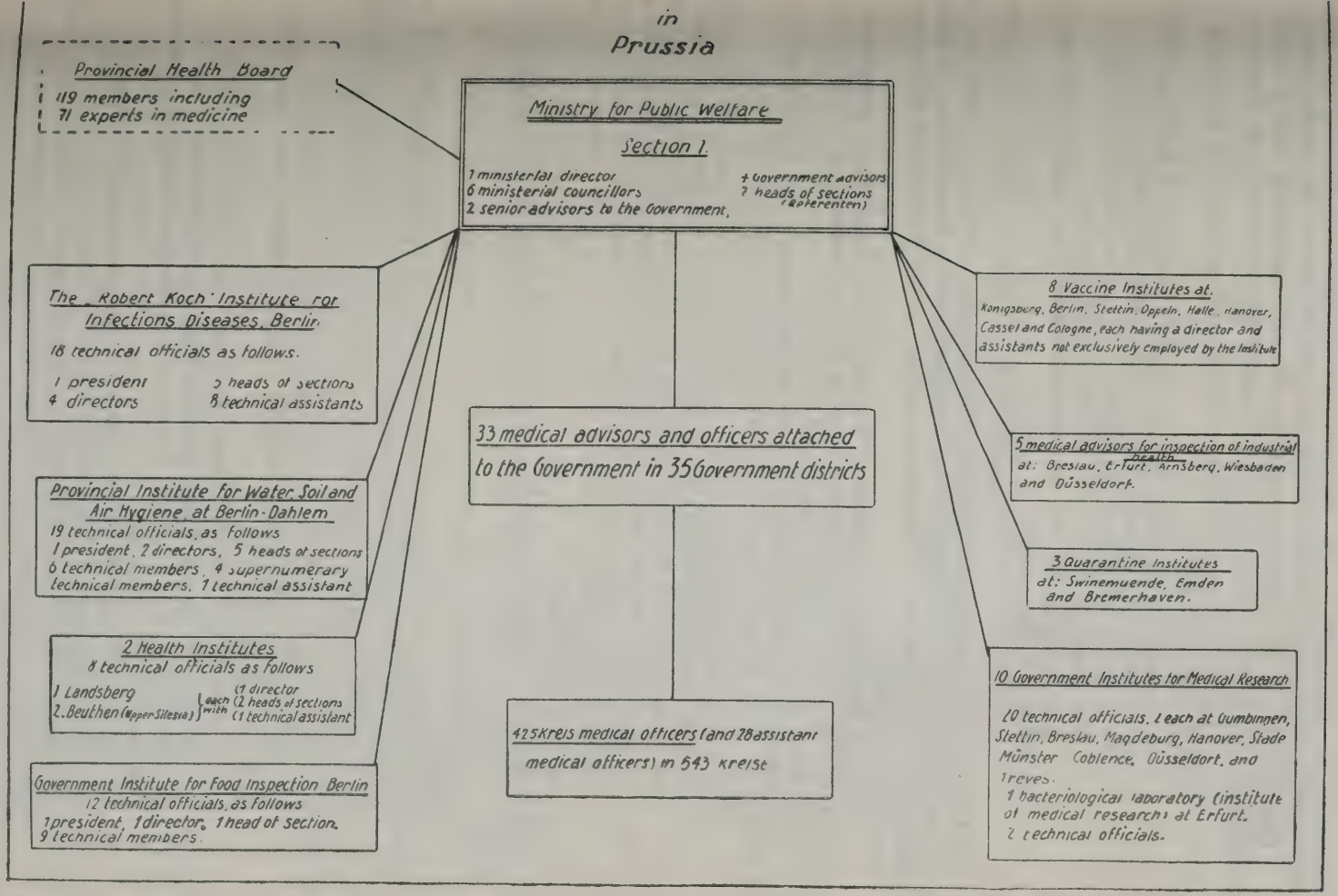
The " Charity Hospital " in Berlin is in receipt of a subsidy of 2,48
(as compared with 2,145,827 M. in 1925) ;

An appropriation of 100,000 M. (65,000 M. in 1925) is provided for the pr
of physical culture in the universities ; 600,000 M. (an increase of 50,000 M.
aside for supplementary allowances to professors, and 274,290 M. for grant
turers *(privatdozenten)* and young graduates, while 1,428,000 M. are for allow
supernumerary assistants in the university, and 125,000 M. for grants in aid of s

The sum of 62,470 M. (as compared with 24,000 M. in the previous year)
allocated for physical culture in the technical high schools.

The budget of the Institute of Experimental Therapeutics at Frank
Main has been increased to 203,780 M.; that of the Emperor William Inst
Experimental Therapeutics at Berlin-Dahlem to 16,480 M. (salary of the d
that of the Emperor William Biological Institute at Dahlem to 32,960
directors).

In the eleven medical faculties of the Prussian universities (Königsberg
Greifswald, Breslau, Halle, Kiel, Göttingen, Münster, Marburg, Bonn and Fr
on-Main) there are 134 ordinary and 87 extraordinary professors, whose total


in
Prussia
Provincial Health Board
119 members including
71 experts in medicine
Ministry for Public Welfare
Section 1.
1 ministerial director
6 ministerial councillors
2 senior advisors to the Government,
+ Government advisors
? heads of sections
(Referenten)
The „Robert Koch" Institute for Infections Diseases, Berlin
18 technical officials as follows.
1 president
4 directors
3 heads of sections
8 technical assistants
Provincial Institute for Water, Soil and Air Hygiene at Berlin-Dahlem
19 technical officials, as follows
1 president, 2 directors, 5 heads of sections
6 technical members, 4 supernumerary technical members, 1 technical assistant
2 Health Institutes
8 technical officials as follows
1 Landsberg
2. Beuthen (Upper Silesia)
each with (1 director, 2 heads of sections, 1 technical assistant)
Government Institute for Food Inspection Berlin
12 technical officials, as follows
1 president, 1 director, 1 head of section.
9 technical members.
33 medical advisors and officers attached to the Government in 35 Government districts
425 Kreis medical officers (and 28 assistant medical officers) in 543 Kreise
8 Vaccine Institutes at:
Königsberg, Berlin, Stettin, Oppeln, Halle, Hanover, Cassel and Cologne, each having a director and assistants not exclusively employed by the Institute
5 medical advisors for inspection of industrial health
at: Breslau, Erfurt, Arnsberg, Wiesbaden and Düsseldorf.
3 Quarantine Institutes
at: Swinemuende, Emden and Bremerhaven.
10 Government Institutes for Medical Research
20 technical officials, 2 each at Gumbinnen, Stettin, Breslau, Magdeburg, Hanover, Stade Münster Coblence, Düsseldorf, and Treves.
1 bacteriological laboratory (Institute of medical research) at Erfurt.
2 technical officials.

amount to 1.7 million M. (The university at Cologne and the Medical Acad
Düsseldorf are not supported by the Prussian State but by the municipal auth

The salaries of the following medical officers, amounting to 3.3 million
provided for under the budget of the Prussian Ministry of Public Welfare :

17 first-grade medical councillors and medical officers (Category
of the scale of salaries) ;
16 medical advisers to the Governments and medical officer
5 medical officers, experts in industrial hygiene ;
8 medical officers attached to the separate Governments ;
284 medical officers in receipt of full salaries ;
142 medical officers in receipt of part-time salaries (of whom
attached to the courts) ;
10 medical officers, directors of official medical laborator

The sum of 10.4 million M. is appropriated for *extraordinary* expenditure on
sities and the " Charity Hospital " (for building costs, the purchase of X-ra
ratus, etc.). The Emperor William Association for the Promotion of Science
a grant of 750,000 M.

A sum of 422,500 M. is provided for under the budget as a permanent
and 133,000 M. as an extraordinary subsidy for the promotion of gymnastics
Prussian Academy of Physical Culture at Spandau.

The appropriations for the protection of youth under the budget of the M
of Public Welfare for 1926 have been considerably increased.

For the care of young persons who have just left school, 4,000
(an increase of 1,000,000 M.) is appropriated ; 400,000 M. (300,000 M
previous year) for the protection of morally endangered and neglecte
ren and for infant welfare ; 23,000,000 M. (15,000,000 M. in 1925) for s
to the communes to cover the expenses of compulsory charity edu
102,000 M. (81,000 M. in 1925) for the relief of persons exposed to m
sexual dangers.

The following *extraordinary* expenditure is provided for under the item "
Health " :

45,000 M. for the organisation of post-graduate courses for
officers ;
30,000 M. for post-graduate courses in social hygiene for doct
dentists and for popular education in hygiene ;
24,000 M. for the upkeep of a laboratory at Wiesbaden for the
of the waters of the Main ;
27,000 M. for th ebacteriological laboratory at Erfurt ;
40,000 M. for the organisation of school health services and for t
of teeth in schools ;
10,000 M. for research into the causes and incidence of cancer ;
50,000 M. as a subsidy to anti-venereal dispensaries ;
60,000 M. for research into and the combating of the disease k
Haffkrankheit ;
10,000 M. for medical police measures connected with the ca
against trachoma and malaria ;
30,000 M. for research at the Robert Koch Institute, dealing wit
pox vaccine, epidemic encephalitis lethargica and tuberculosis ;

30,000 M. to complete the internal installation of the public health nstitutes and establishments.

der the heading of " General Welfare " appears as *extraordinary* expenditure :

250,000 M. as a maintenance grant for the orphanage at Potsdam (Grosse-Waisenhaus) ;
1,600,000 M. in aid of public and private welfare measures ;
300,000 M. to provide for the care of delicate or underfed children in the country or in children's homes and for school outings.

e following appropriations are also made :

50,000 M. for the official inspection of pharmacies ;
296,000 M. for medical police measures ;
61,750 M. for the supervision of ports and vessels and the upkeep of quarantine stations at Swinemünde, Bremerhaven and Emden.
10,000 M. for measures taken in application of the law for the prevention of infectious diseases ;
120,000 M. for medical inspection of controlled prostitutes ;
400,000 M. as subsidies for the campaign against tuberculosis ;
100,000 M. in aid of district midwifery ;
400,000 M. for the prevention of infant mortality ;
428,000 M. for ten medical laboratories ;
469,532 M. for the Robert Koch Institute for Infectious Diseases ;
196,372 M. for the Government Institute for Food Inspection ;
96,601 M. for the Provincial Institute for Water, Soil and Air Hygiene;
70,785 M. for the Institute of Hygiene at Landsberg ;
91,859 M. for the Institute of Hygiene at Beuthen (Upper Silesia).

e sum of 138,000,000 M. is appropriated for the building of houses, being taken he receipts of the general financial administration from the tax levied as com- on for the release of building property from its debts (*Gebäudeentschuldungs-*

Bavaria.—The following facts and figures show the expenditure on public by Bavaria, the second largest of the Federal States, as estimated in the budget Ministry of the Interior for 1926.
e salaries of medical officers (7 of the first grade, 24 medical officers attached provincial courts, and 169 district medical officers) amount to 1,405,590 M.

e following items are provided for under the chapter " Public Health " :

150,000 M. for maternity and infant and child welfare ;
50,000 M. for the care of cripples ;
100,000 M. for school-children and young persons between 14 and 18 years of age whose health is endangered ;
130,000 M. for the campaign against tuberculosis ;
20,000 M. for the campaign against venereal diseases ;
10,000 M. for the temperance campaign ;
30,000 M. for the organisation of technical continuation courses for doctors and women welfare workers ;
100,000 M. for the further development of medical administrations.

Expenditure on the upkeep of the State Vaccine Institute amounts to 5
and the receipts to 24,000 M.

The cost of the upkeep of the institutes for food inspection at Munich, E
and Würzburg amount to 258,910 M., while the receipts are 150,900 M. T
of the bacteriological research institutes at Munich, Erlangen-Nuremberg an
burg-Landau amounts to 243,330 M., while the receipts are 157,600 M. The
for the provincial hospital at Coburg amounts to 35,000 M.

The sum of 15,000 M. is allocated for midwifery, and 1,500 M. for ins
of the personnel in bathing establishments.

The budget for the protection of youth amounts to 855,730 M. and fo
welfare to 2,170,000 M.

(c) *Saxony.*—The budget for the financial year 1926 of the Ministry of t
rior in the Free State of Saxony provides for the salaries of :

4 medical councillors of the first grade attached to the *Kreise*
hauptmannschaften) ;

2 medical councillors of the first grade ;

22 government medical councillors attached to the medical

The budget of the women's clinics at Dresden and Chemnitz and of the
at Zwickau shows an expenditure of 3,406,500 M. and receipts of only 1,279
necessitating a supplementary grant of 2,127,000 M. The mental homes and
asylums, with an average of 7,200 mental patients, require a subsidy of 82

The budget of the Saxon Provincial Health Office also requires a sul
117,020 M. ; 10,000 M. are provided for the training of doctors, chemists, etc., a
M. for the campaign against infectious diseases.

The laboratories of the Public Health Service are in receipt of a subsidy of 41
their expenditure being 217,370 M. and receipts 176,000 M.

The polyclinics and Government institutes for medical gymnastics and
require an additional grant of 9,820 M.

The cost of the medical and veterinary police amounts to 499,960 M., o
160,000 M. are earmarked for the development of midwifery and 78,500 M. for
medical police measures. The last item includes a grant of 20,000 M. for ep
2,500 M. for public health instruction and 50,000 M. for the German Health M
15,000 M. are allocated for the support of doctors.

The Government subsidies for purposes of public welfare amount to 1,080,
2,000,000 M. are appropriated for the relief of indigent persons belonging to t
vincial Relief Association. The proportion of the costs of treating indigent
in Government institutes borne by the Provincial Relief Association amo
5,000,000 M.

II. RECENT DEVELOPMENTS IN HEALTH ADMINISTRATION LEGISLATION.

1. *Health Legislation in the German Reich.*

(a) The law of January 22nd, 1925, regarding the Reich Arbitratio
(*V.R.G.A.*[1], 1925, page 98), contains provisions for the setting up of an arb
office of the Reich attached to the Reich Insurance Office, consisting of i

[1] Publications of the Reich Health Office.

s and honorary representatives of doctors and sickness insurance offices. ch Arbitration Office is competent to decide on all appeals from the decisions rbitration offices.

A decree of the Reich Minister for Labour of May 12th, 1925 (*V.R.G.A.* ıge 373), provides for the extension of accident insurance to the following ional diseases : diseases caused by lead, phosphorus, mercury, arsenic, bensol, d amido compounds of the aromatic series, carbonic disulphide ; cancer of caused by soot, paraffin, coal tar, anthracene, pitch and analogous substances ; ers' cataract, diseases arising from X-rays and other forms of radioactivity ; anchylostomiasis, Schneeberger's pulmonary disease.

The law of July 31st, 1915, amending the law regarding the employment of in industries (*V.R.G.A.* 1925, page 610), prohibits the employment of chil- cinematograph films, but allows exceptions in regard to children over 3 in al cases.

lth Legislation in Prussia.

Prussia, the following decrees were issued :

A ministerial decree of December 23rd, 1924 (*V.R.G.A.* 1925, page 110), the use of hydrocyanic acid and its derivatives for the prevention of parasites.

A ministerial decree of May 4th, 1925 (*V.R.G.A.* 1925, page 429), deals nt-work for bakers and confectioners. Bakers may obtain permission to begin 5 a.m., but may not send out or sell their goods before 7 a.m.

information concerning tuberculosis legislation, reference should be made to iculars given in Part III, 1 ; and in regard to other diseases, to paragraph 4

rnational Sanitary Conventions.

ventions have been concluded with the following countries :

Convention of December 18th, 1922, between the German Reich and the epublic regarding the mutual interchange of information relating to cases ious disease within the frontier zones of both countries (*V.R.G.A.* 1925,). The interchange of information between the administrative authorities wo frontier zones shall extend to the following diseases : cholera, plague, , spotted fever, leprosy, typhoid fever, paratyphoid, dysentery, diphtheria, ever, epidemic cerebro-spinal meningitis, infantile paralysis, encephalitis a, relapsing fever, trachoma, hydrophobia, as well as bites caused by animals from or suspected of suffering from rabies, and malaria.

A treaty of December 14th, 1924, supplementing the German-Austrian ial Agreement of September 1st, 1920 (*V.R.G.A.* 1925, page 57), contains a on regarding epizootic diseases and provisions regarding the disinfection of cattle-trucks.

The law of March 21st, 1925, regarding the adhesion of Germany to the Convention relating to the suppression of false indications of the origin of *V.R.G.A.* 1925, page 386). The Madrid Convention of April 14th, 1891, s revised at Washington on June 2nd, 1911, was originally concluded between uba, Spain, France, Great Britain, Portugal, Switzerland and Tunis. The ides that goods with false indications of origin shall, upon importation or on, be seized by the Customs authorities for the purpose of removing the ication.

(d) German-Belgian Convention of July 23rd and August 17th, 1925, r the prevention of rabies among dogs in the frontier zones (*V.R.G.A.* 1925, pa Notification by both parties must be given 24 hours after the diagnosis of suspected cases ; the frontier zones consist of those communes which are sit the frontier or within 10 kilometers of the frontier.

(e) German-Belgian Convention of July 23rd and August 17th, 1925, r the interchange of information relating to infectious diseases in the front (*V.R.G.A.* 1925, page 780). The interchange of information extends to the diseases : cholera, smallpox, plague, spotted fever, typhoid fever, scarlet fev theria, dysentery, cerebro-spinal meningitis, hydrophobia, relapsing fever, a peral fever when there is a comparatively high incidence.

4. *Epidemic and Infectious Diseases.*

No changes were made in Germany during 1925 in regard to arrange the prevention of infectious diseases.

In *Prussia*, provisions were issued on February 11th, 1925 (*V.R.G.* page 234), for applying the law of June 23rd, 1924 (*V.R.G.A.* 1925, page 53 which epidemic infantile paralysis was included in the list of notifiable dise the regulations in regard to enquiry in cases of meningitis were amplified.

In *Baden*, a ministerial decree of January 16th, 1925 (*V.R.G.A.* 1925, p amended the decree of May 11th, 1911, regarding the prevention of infectious and made it compulsory in cases of typhoid fever to continue until th teriological examinations of the fæces and urine of the patient, made at of at least a week, after ten days of normal temperature, have given negative in regard to typhoid bacilli. If the tests are still positive after three weeks, may be discontinued, but the germ-carrier must be warned that he is a dang neighbours.

The following table gives information in regard to the incidence of important of the notifiable diseases among the civilian population of the 1925 (52 weeks).

Disease	Total Number of Notified Cases	Incidence per 10,0 of the Populatio
Diphtheria	36,296	5.82
Scarlet fever	39,919	6.40
Typhoid fever	12,476	2.00
Dysentery	4,775	0.77
Puerperal fever	7,003	1.12
Cerebro-spinal meningitis ..	750	0.12
Trachoma	2,777	0.45
Infantile paralysis	386	0.06

III. PREVENTIVE MEDICINE AND HYGIENE.

1. *Tuberculosis.*

The decrease in deaths from tuberculosis which we noted in the *Year* 1924 has fortunately continued during 1925.

In the 46 chief cities of Germany with 100,000 or more inhabitants, rep approximately 27 per cent of the total German population, the death rate, c per 10,000 inhabitants and for a period of a year, was as follows :

culosis	I.	II.	III.	IV.	Total for the Year
		Quarter			
4	16.2	14.9	11.1	11.2	13.5
5	13.1	12.8	10.3	10.6	11.7

actual number of deaths in the principal German towns is as follows :

ar	Population	Deaths from Tuberculosis
4	16,668,000	22,583, of which 2,278 were children under 15.
5	16,903,000	19,805, of which 2,090 were children under 15.

rtality from tuberculosis has therefore substantially decreased during the last rs, having fallen from 17.1 in 1923 to 13.5 in 1924 and to 11.7 in 1925, in each 10,000 inhabitants.

regards children under 15, the death rate from tuberculosis fell from 2.0 in 1.4 in 1924 and 1.0 in 1925.

imilar decrease in the tuberculosis death rate is shown by the statistics of 334 towns with 15,000 or more inhabitants, representing approximately five- (42.2 per cent) of the total population of the Reich. In these towns, deaths berculosis, which in 1923 were still 17.8 per 10,000 inhabitants, were in 1924 in 1925 10.8. If these figures are to be used for comparison, however, account taken of the fact that the figures for 1923 and 1924 include persons not g to the towns in question, whereas these are not reckoned in the figures (*Reichsgesundheitsblatt* 1926, page 426).

the whole German Reich, only provisional figures up to 1924 are available. ow the death rate from tuberculosis per 10,000 inhabitants as follows :

r	Death-rate	Year	Death-rate
1	13.7	1923	15.0
2	14.2	1924	12.0

s impossible to supply exact figures for the whole German Reich regarding dence of the disease, as notification of cases of infectious tuberculosis of the larynx is not yet compulsory in all the German States.

Prussia, the largest of the German Federal States, which, with its 38,000,000 nts represents about 61 per cent of the total population, the number of cases in 1924 in conformity with the Prussian Tuberculosis Law of August 4th, s 50,104 cases of infectious tuberculosis of the lungs or larynx, that is, 13.26 00 inhabitants of Prussia. This figure rose, for 1925, to 53,362, that is, r 10,000 of the resident population according to the census of June 16th, 1925 *esundheitsblatt* 1926, page 117).

Saxony, in 1925, 5,466 (10.94 per 10,000 of the resident population) ; in *Olden-* (4.78) ; in *Lippe* 268 (16.34) ; and in *Waldeck* 13 (2.28) cases of tuberculosis ified. It may be assumed that these figures are all substantially too low ; he tables comparable, since the conditions in which the statistics are drawn in the separate States.

Reich Health Office intends to draw up fresh statistics on the lines of those in regard to cases of tuberculosis among doctors and nurses in hospitals

In Prussia, a ministerial decree of February 23rd, 1925 (*V.R.G.A.* 1925, p recommends that visitors to baths who are infected with open tuberculosis, suspicion of suffering from the disease, should not be admitted to the public i rooms but should be allotted separate cabins.

At a meeting of the Reich Council of Public Health on December 11 general lines were laid down for the care of tuberculosis cases and suspect children in the various classes of homes for children (tuberculosis sanatoria for suffering from pulmonary or surgical tuberculosis, seaside homes, convalesce and similar institutions) or for sending these children to tuberculosis centres t under continuous observation. The reports have been published in the *Ges füsorge für das Kindesalter*, Vol. 1, No. 4, page 258.

The annual meetings of the Central German Committee for combating tul took place in Berlin on May 21st and 22nd, 1925. The general meeting held 21st dealt with " the methods of ensuring results from tuberculosis treat the meeting of the Committee for the Middle-Classes with " the results of Re sures of assistance " ; and the meeting of the centres for tuberculosis work 22nd, 1925, with " the legal provisions in regard to social assistance for tuber A full report on these annual meetings appeared in the *Zeitschrift für Tul* Vol. 42, No. 7.

Following these meetings, a tuberculosis congress was organised at Danzig May 24th and 27th, 1925, by the Joint Committee of the Association of D Tuberculosis Sanatoria and the Association of Doctors of the German Ser Social Assistance to Tuberculous Persons. The lectures given during this appeared in Brauer's *Beiträge zur Klinik der Tuberkulose*, Vol. 62, Nos. 1 ar

The Present State of Tuberculosis Legislation.

The Reich tuberculosis law which it is proposed to submit to parliamen securing for the whole territory of the Reich a new and uniform regulation of concerning the combating of tuberculosis. This unification seems highly for the reason that hitherto legal and other regulations against tubercul differed very considerably in the various German States, and because also in paign against tuberculosis, which threatens all the German peoples equally, front promises more success than the present methods.

A comparison of the legal regulations hitherto issued by the different States, and which are laid down either in the epidemic laws or in special tuberculosis, furnishes an indication of the various points of view which ha taken into account in the State organisation of the campaign against tul among human beings.

1. *Prussia*, which by its law of August 28th, 1905, regarding the com contagious diseases, had only established a limited degree of compulsory no for deaths from tuberculosis of the lungs and larynx, has issued new regul tuberculosis under the law of August 4th, 1923, concerning the combating of losis (*V.R.G.A.*) 1923, pages 613-614).

According to this law, every infectious case and every death from tul of the lungs and larynx must now be notified in Prussia within eight days, in of deaths within 24 hours, to the competent medical officer or to an officially r notification office (Office of Social Assistance, Public Health or Welfare Offi duty of notification is incumbent upon the medical attendant only and, when suffering from one of these diseases changes his residence, upon the he

ld only. Further, the competent bacteriological office must report on each ation of sputum made with a view to discovering tuberculosis bacilli to the submitting the sample, and, if the reaction is positive, it must inform the ent notification office. The social assistance offices for tubercular cases are l by the law to take the necessary measures of assistance as far as possible in ent with the doctor in attendance. The medical officer must transmit the tions received to the social assistance office when the latter is not recognised ification office ; *vice versa*, the competent notification office must notify each tuberculosis to the medical officer.

e regulations for the application of the Prussian law on tuberculosis of August 3 (*V.R.G.A.* 1923, page 727), provide that by " infectious ", within the meanhe law, shall be understood not only every case of tuberculosis of the larynx ned by clinical examination, even when there is no proof of bacilli in the spu- t also every pulmonary case of tuberculosis in which either tuberculosis bacilli en found in the sputum or in which the previous course of the disease and clinical ation presuppose that the sputum contains bacilli.

e Prussian executive regulations provide the following measures of assistance : ruction of the patient and his immediate circle, the protection of the members amily and other persons around him against infection and the prophylactic nt of exposed persons ; measures to prevent the spread of the disease by the in the exercise of his calling ; any necessary treatment of the patient, and, if l, his removal to a hospital or to a sanatorium for lung cases.

In *Bavaria*, according to the decree of May 9th, 1911, for the combating of ous diseases (*V.R.G.A.* 1911, page 616), any death from an open form of losis of the lungs or larynx and any case of these diseases in the open form persons living in an educational establishment or in rooms which are attached or frequenting such establishments, must be notified to the police. By the cree, the local governments and the district police authorities are empowered police measures in their districts or in parts thereof to introduce compulsory tion of cases of open tuberculosis of the lungs or larynx whenever patients te a source of danger to the neighbourhood in consequence of unfavourable onditions. In Bavaria, the duty of notification falls only upon the medical nt and any other person occupied in treating the patient. Young persons who ering from open tuberculosis of the lungs or larynx must be prevented from ig educational establishments.

In *Saxony*, new regulations have been laid down for the anti-tuberculosis gn through the Welfare Law of March 28th, 1925 (*V.R.G.A.* 1925, page 254), ough the regulations in application of this law dated March 20th, 1926 (Saxon *zette*, page 69). The district welfare associations are required, in agreement e medical police, to execute measures for the treatment of tuberculosis cases the prevention of tubercular infection. For this purpose, they have to establ maintain medical institutions for the care of tuberculosis.

cases which are established by clinical or bacteriological examination and which te a danger to the health of the neighbourhood, that is to say, any case which ealed the presence of tubercular bacilli or the symptoms of which point to the ary existence of such bacilli (active tuberculosis), notification must be made in to the competent welfare and child protection office by the doctor in attendthin three days, and, in the case of deaths from tuberculosis of the lungs or within 24 hours. In the case of deaths where no doctor was called in, the notimust be made by the woman who lays out the body. Deaths in hotels,

inns and lodging-houses or in boarding-schools must be separately record health insurance offices are required to notify cases of tuberculosis among th bers to the competent insurance office, which is under the obligation to tran notification without delay to the welfare and child protection office. Cl residence on the part of a person suffering from infectious tuberculosis must b in writing by the head of the household immediately on receipt of informati welfare and child protection office must keep a nominal roll of notified cases an it must keep itself informed of the execution of measures taken by families to tuberculosis, and must within three days transmit notifications received to petent district medical officers. Children with open tuberculosis of the lu be prohibited from attending school, irrespective of the stage of their disease ; suffering from tuberculosis of the skin, bones, glands, or other organs must bited from attending school if the school doctor or the district medical officer it necessary. Similarly, teachers suffering from open tuberculosis of the lu be prevented from teaching.

4. In *Wurtemberg* a ministerial decree of February 9th, 1910 (*V.R.G.* page 354) provides that any change of residence by a person suffering from a or open tuberculosis of the lungs or larynx and any death from these diseas immediately be notified to the local police authorities. This duty of not applies to cases in which persons suffering from open tuberculosis of the larynx are a danger to the neighbourhood in consequence of confined or o unsatisfactory living conditions. Special measures are taken to deal with tuberculosis in schools (*V.R.G.A.* 1910, page 588). The compulsory isolat tubercular patient in a hospital or other premises need only be considered spite of all instruction and advice, the patient or his family continue to enda health of other persons.

5. In *Baden*, in virtue of a decree of May 9th, 1911 (*V.R.G.A.* 1911, p notification must be made of all deaths from tuberculosis of the lungs or lar of all cases of these diseases, when the patient is highly dangerous to his surro by reason of his living conditions, when a person suffering from open tuberc the lungs or larynx (tubercular bacilli found in the sputum) changes his resid finally, when a person suffering from these diseases is resident in a school or edu establishment or in premises attached thereto, or is a danger to his surro through participation in classes or lectures. In the case of persons suffering fr tuberculosis of the lungs or larynx, isolation may be ordered in such a form possible, a special bedroom or at least a special bed, as far as possible remov other beds, is provided for these persons. Pupils and teachers suffering fro culosis of the lungs or larynx must be excluded from the class-rooms when a long as tuberculosis bacilli are found in the sputum. In the Baden health compulsory notification may be extended to all cases of tuberculosis of the larynx. Further measures may be taken for the accommodation of such their medical supervision, etc. Baden health resorts may also be forbidden t visitors suffering from tuberculosis of the lungs or larynx otherwise than in h such a measure applying either to the whole town or only to certain part

6. In *Thuringia*, in the absence of a single Thuringian epidemic law, th laws on epidemics which were enacted in the separate districts between 1911 a are still in force. According to these laws, deaths from tuberculosis of the l larynx are compulsorily notifiable, but cases need only be notified when suffering from open tuberculosis of the lungs or larynx changes residence.

e new Thuringian Epidemic Bill provides for the compulsory notification of s of infectious tuberculosis of the lungs or larynx.

In *Hesse*, the notification of tuberculosis is regulated in the different *Kreise* e decrees, which agree in their substance and very often in their wording— , as regards the most important points.
ese decrees, which came into force between 1910 and 1912, require that tion should be made :

(a) When a person in an advanced state of tuberculosis of the lungs or larynx changes his residence or constitutes a serious danger to his surroundings in consequence of confined living conditions or for other reasons ;

(b) In the case of all deaths from tuberculosis of the lungs or larynx.

Hamburg, through a decree of the Public Health Service of March 17th, 1910 *A.* 1910, page 439), requires the doctors to notify to the Health Office those tuberculosis which affect persons engaged in foodstuffs industries and who reason constitute a danger to their surroundings. Further, all cases of tubermust be notified in which the doctor considers it necessary to order disinfection, mple, by a change of residence.

In *Mecklenburg-Schwerin*, where formerly tuberculosis was not legally le, the campaign against this disease was regulated by a law of February 19th, *V.R.G.A.* 1924, page 295), by which doctors are required to notify to the ent medical officer within three days any case of tuberculosis, and any deaths is disease, which come to their knowledge in the exercise of their profession ; ification must be made on printed letter-cards issued by the medical officer free. The doctor is required to notify the case irrespective of whether the or deceased person was previously treated by some other doctor and notified ; duty of the *Kreis* doctor to eliminate duplicate notifications. The medical must transmit each week the notifications received to the competent welfare which, after four weeks, returns them to the *Kreis* doctor with a note upon them ng the measures employed (decree of April 1st, 1924).
other provision of the law, whereby welfare offices are required to establish intain tuberculosis care centres up to the required number—at least one per dent municipality or district *(Amt)*—marks a great advance in the practical gn against tuberculosis. On April 1st, 1924, the Ministry for Public Health, rvising authority, issued the necessary instructions for the establishment and of these care centres, and it also decides whether the number of these centres ient to meet requirements (*V.R.G.A.* 1924, page 396).

Tuberculosis legislation was newly regulated in the Free State of *Oldenburg* urg district) in 1921 by a ministerial decree of May 6th, 1921 (*V.R.G.A.* age 394), regarding the notification of contagious diseases. Whereas the decree ust 24th, 1904 (*V.R.G.A.* 1904, page 1055), had only required notification ns from tuberculosis and of advanced cases when the patient changed his resithe new decree (§ 6) stipulates that any cases of infectious tuberculosis of the r larynx must be notified.
tification must be made by the doctor in attendance on a prescribed form ree of charge by the police authorities.
tification of death and of change of residence by the patient must be made the doctor in attendance; (2) any other person engaged in treating or attending patient professionally ; (3) the head of the household ; (4) the person in whose

house the case of disease or death occurs. The obligation mentioned in (only applies when there is no one responsible under (1).

Notification must be made to the district medical officer competent in t where the patient is residing.

Similar decrees regarding the notification of contagious diseases were is the district of Lübeck on June 15th, 1921, and for the district of Birkenfeld 6th, 1922 (*V.R.G.A.* 1922, page 414).

11. For *Brunswick*, the law of June 26th, 1904 (*V.R.G.A.* 1904, page 9 vides that every death from tuberculosis of the lungs or larynx is notifiable any case of this disease where a person suffering from an advanced form of th culosis changes residence. The duty of notification extends to the doctor in ance, the head of the household, the nurses, the occupant of the house and th responsible for certifying death. The medical officer need only diagnose of tuberculosis if this has not already been done by another doctor.

12. *Anhalt*, by a police decree of June 12th, 1906 (*Collection of Laws*, p introduced the compulsory notification of all deaths from tuberculosis of the larynx, of advanced cases of this kind when residence is changed, and of all tuberculosis of the lungs or larynx among children in schools or other edu or teaching establishments or infant schools, or in premises belonging theret

13. In *Bremen* (decree of April 27th, 1907), any death from open tub of the lungs or larynx must be immediately notified to the competent heal in the place where death occurred, and any change of residence by a person from these diseases must similarly be notified to the competent office in the which is being quitted.

14. In *Lippe*, according to the law of April 12th, 1920 (*V.R.G.A.* 19 932), each case of or death from infectious tuberculosis has to be notified to the office within 12 hours, as also any change of residence by a person suffering fro culosis. Notification is the duty of the doctor in attendance, of the head of th hold, the nurses, teachers, occupants of the house, and the person responsible fying death.

Tubercular cases, before being sent to a family for a rest cure, must ob permission of the police authorities, which will be refused if the *Kreis* doctor c that this would risk spreading tuberculosis. Persons suffering from infectiou culosis must place themselves under the observation of the tuberculosis care their district ; at the orders of the *Kreis* doctor or medical officer at the ca they must present themselves at the hours of consultation for tubercular case fully furnish all information asked for, and conform exactly with the inst given them. The patient and all the members of his family living with h submit to medical examination.

15. In *Lübeck*, a decree of August 19th, 1908 (*V.R.G.A.* 1908, pag imposes upon doctors the duty of notifying deaths from all kinds of tub and cases of open tuberculosis of the lungs or larynx :

(a) If the affected person leaves his residence or is taken to h

(b) If the patient's manner of living or housing conditions are seriously to endanger his surroundings ;

(c) If the patient is engaged in the manufacture or sale of foo

(d) If the patient is living in surroundings which threaten to e the health of a large number of persons—for example, in a private orphanage, almshouse or home for incurables, in an hotel or lodgin or in a boarding or other school.

Mecklenburg-Strelitz has up to the present no legal regulations for the com- of tuberculosis.

Waldeck, by a police order of December 20th, 1909 (*V.R.A.G.* 1910, page nakes compulsorily notifiable any case of or death from tuberculosis of the : larynx as soon as bacilli have been found ; also any change of residence by ase. The duty of notifying the police authorities lies upon the doctor in attend- ıe head of the household, any nurse and any person in whose house the case culosis or the death has occurred or from whose house the tubercular case has d.

In *Schaumburg-Lippe*, only deaths from tuberculosis of the lungs or larynx merly notifiable, in virtue of the police decree of December 10th, 1907. The by the Provincial Government of February 26th, 1924 (*V.R.G.A.* 1924, page tended notification to " every infectious case and every death from tuber- ", thereby going further than the Prussian Tuberculosis Law of August 4th, hich only applies to cases of tuberculosis of the lungs and larynx. In Schaum- ppe, notification must be made to the competent *Kreis* doctor, who must t the notification without delay to the competent visiting nurse. Whereas ia the doctor in attendance is alone responsible for notifying cases and deaths, mberg-Lippe, the duty of notification extends, when no doctor has been called ıe head of the household and any other person occupied with the treatment of the patient. On the occasion of a change of residence by the patient, the the household must, as in Prussia, notify the fact. The remaining regulations nd, sometimes even textually, to the regulations in the Prussian law on tuber-

On October 31st, 1923, in virtue of paragraphs 19 and 23 of the Annex to IV (Part III) of the Treaty of Versailles, the Governing Commission of the *rritory* issued a decree for the combating of tuberculosis, which declared compul- otifiable (§ 1) :

(a) Within three days, any established case of infectious tuberculosis ;

(b) Any change of residence (including removal to a hospital) on the part of any person suffering from infectious tuberculosis, notification to be made at latest 48 hours before removal ;

(c) Within 24 hours, all deaths from tuberculosis of any kind.

duty of notification is incumbent upon the doctor in attendance, the school the medical officer of the welfare office, the hospital doctor ; also, in the case the head of the household, and, in the case of *(c)*, the person responsible for ıg death in *Kreise* where these functions are not exercised by a doctor (§ 2). ification is made confidentally to the competent *Kreis* doctor, who must ıtely communicate with the *Kreis* Welfare Office (§ 3). The latter, which s to take measures to prevent the spread of the disease and to look after the and his family, may (§ 5) request the Central Welfare Office to order the con- of the patient to a hospital in cases when the person concerned refuses to with the prescribed measures. If the patient refuses to go to hospital, the Welfare Office may order him to be taken there by force at his own expense ıe case of necessitous persons, at the cost of the Central Welfare Office (§ 8). t of disinfection is borne by the commune.

agraph 6 provides for the exceptional case whereby, at the request of the *Kreis* Office, all undertakings which are known, or which are reported by the work- be liable to infect the workers with tuberculosis, must be inspected at least

once a year jointly by the *Kreis* Welfare medical officer, a representative of the the factory inspector and, where such exists, by the factory medical officer

The regulations issued in execution of the decree describe as infectious the meaning of the decree, not only cases of tuberculosis of the lung and established by clinical examination but also any case of tuberculosis of the bones and joints showing purulent secretions or fistulas, any established cases culosis of the intestines, kidneys and skin, and cases of lupus.

The remaining provisions in the executive regulations are almost word the same as those in the Prussian Tuberculosis Law of August 4th, 1923 (1923, page 727).

Reports of the Medical Laboratory Service showing the presence of tub bacilli may not be used in order to prosecute a medical attendant for om notify the case.

If account is taken of all this diversity in the legal regulations for the co of a disease which takes the same course in all parts of Germany, the deman unification of legal measures against tuberculosis throughout the Reich appe justified.

2. *Cancer.*

During the year covered by the present report, no special measures we against cancer.

The increase in the death rate of the large towns from cancer and other m growths, which rose from 19,693 in 1923 to 21,208 in 1924 and 21,995 in 192 bably due in part to more accurate diagnosis and therefore fuller returns in these diseases.

According to the causes of death statistics, the following are the figures fo from malignant tumours per 10,000 inhabitants for the whole German Reich (e Mecklenburg-Strelitz) :

Year	Cancer	Other Tumours
1922	56,737 (9.4)	5,991 (1.0)
1923	58,291 (9.5)	6,275 (1.0)

In 1923, the number of deaths from cancer was 8.6 per 10,000 of the compared with 10.2 per 10,000 of the female population.

3. *Venereal Diseases.*

Since the 1919 census of venereal diseases for the German Reich, a new census has been taken in certain towns only (Bremen 1922, Nuremberg 1920-Frankfurt-on-Main 1925). General practitioners and specialists are of opin there has been a fairly substantial decrease since 1922 in the number of fresh primary syphilis. This improvement is attributed in the main to Salvarsan tr which, apart from its curative effects, converts the open and infectious form o into a closed and non-infectious form of the disease.

The Reich Bill concerning the campaign against venereal diseases has been passed by the Reichstag.

4. *Malaria.*

Malaria is not important in Germany. According to the statistics of

[1] See *Reichsgesundheitsblatt*, 1926, page 153, and Supplement I to No. 1 of the *Reichsgesundheitsblatt*, Januar

mortality from malaria in the Reich was as follows : 1922, 59 persons ; 1923, ons ; 1924, 60 persons.

e disease is not compulsorily notifiable except in a few of the Federal States. , 15 cases were notified in Wurtemberg, 7 in Baden and 2 in Mecklenburg- n.

choma.

e number of cases notified was as follows : 1924, 1,800 ; 1925, 2,777.
e majority of these cases occurred in Prussia. In 1925 alone, there were 2,201, in the districts of Allenstein, Gumbinnen, Königsberg and Arnsberg. The ncidence last year is attributed to the increased number of immigrant Polish n.

llpox.

th a view to the prevention of smallpox, a vaccination law was passed in Ger- n April 8th, 1874, making vaccination of infants and school-children compulsory. egular vaccinations are supplemented by the executory provisions of the Reich arding epidemics, which in 1904 were co-ordinated in the form of an instruction General Council. The latter was supplemented in 1907 by *Advice to Doctors d to combating Smallpox*, which was drawn up by the Reich Public Health Office. co-operation with the directors of the official vaccination offices, the Reich Health Office laid down general rules for carrying out the bacteriological ation of anti-smallpox vaccine. These were notified to the Governments ederal States in a circular of the Reich Ministry of the Interior dated April 925 (*V.R.G.A.* 1925, page 386). The prescribed bacteriological analysis of cine is intended to establish the presence of pathogenic bacteria, especially bacilli, staphylococci, streptococci, and the bacteria of the group of typhoid i bacilli.

e annual report of the Reich Public Health Offfice on smallpox and vacci- leals with the results of preventive vaccination against smallpox, the work h-preparing institutes, and the results of the smallpox statistics in the German It has recently been found possible to abolish the last-mentioned table of s, because the number of cases was too small.

the last five years for which reports have been drawn up, the number of cases from smallpox in the German Reich was as follows :

1921	1922	1923	1924	1925
[1] (100)	215[2] (28)	17 (2)	16 (2)	24 (9)

September 28th and 29th, 1925, an assembly of the Union of Committees and s of the German State Vaccine Institutes took place at Darmstadt. The of these meetings appeared in Nos. 15 and 16 of Volume 12 of the *Zentralblatt Gesamte Hygiene.*

e weight of the objections brought against preventive anti-smallpox vaccina- discussed in a memorandum entitled *Smallpox and Preventive Anti-Smallpox tion*, published by I. Springer, Berlin ; the fourth edition was published by the Health Office in March 1926.

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[1] Increased figures for 1921 relate to the industrial district of Upper Silesia. The importation and spread of as favoured by political troubles and by the fact that, at this period, the German frontiers were open on the and and Czechoslovakia.

[2] Increased figures for 1922 are due to the importation of this disease from Poland and Galicia, and in particular mic of 135 cases at Laband (Oppeln district).

7. *Alcoholism.*

The consumption of alcohol for drinking purposes increased again in G during 1924-25 in comparison with the period 1923-24. It is substantially l in the pre-war period, but exceeds the consumption during the war years.

The following table shows the consumption of alcohol for drinking calculated at 100 per cent alcoholic content.

Financial Year (Oct. 1st to Sept. 30th)	Alcohol Produced		Total	
	At Home Hectolitres	Abroad Hectolitres	Hectolitres	Litres
1912–13	1,857,299	13,901	1,871,200	
1918-19			117,600	
1919–20	95,811	323,869	419,680	
1921–22	887,327	267,360	1,154,687	
1922–23 [1]	587,290	25,103	612,393	
1923–24 [1]	347,425	7,720	355,145	
1924–25	626,675	14,670	641,353	

(Taken from the *Stat. Jahrbuch für das Deutsche Reich*, 1926, page 318, an the *Vierteljahrshefte zur Statistik des Deutschen Reichs*, 1926, No. 2.)

The following table shows the consumption of beer in the area in which a duty on beer.

Financial Year (April 1st to March 31st)	Consumption of Beer in 1,000 Hectolitres	Number of Li per Head of Pop
1913 [2]	68,818	102.1
1921	33,585	54.2
1922 [3]	30,718	51.2
1923 [3]	27,759	44.9
1924	37,420	60 1
1925	47,153	75.0

(*Stat. Jahrbuch for das Deutsche Reich*, 1926, page 317.)

The following table shows the total consumption of products liable to w (wine and must from grapes, beverages analogous to wine, beverages containi sparkling wines from fruits and other sparkling wines).

The total consumption and the consumption per head of the population could not be determined exact quence of measures taken by the Occupying Powers.

[2] These figures relate to the German Customs territory as it was at that date.

[3] The figures are incomplete or provisional.

Financial Year (April 1st to March 31st)	Total Consumption in Hectolitres	Number of Litres per Head of Population
.. ..	3,007,600	5.4 [1]
.. ..	1,884,809	3.6 [1]
.. ..	2,580,001	4.2 [1]

(*Stat. Jahrbuch für das Deutsche Reich*, 1926, page 38).

ording to the *Medizinalstatistische Mitteilungen des Reichsgesundheitsamtes*, ber of persons treated for alcoholism and delirium tremens in German general and mental homes was as follows :

ear	General Hospitals			Mental Homes		
	Males	Females	Total	Males	Females	Total
.. ..	1,707	244	1,951	3,244	440	3,684
.. ..	2,704	352	3,056	4,879	482	5,361
.. ..	4,056	467	4,523	6,782	602	7,384
.. ..	2,167	293	2,460	5,212	395	5,607

regulation of the temperance campaign by means of a Reich law regarding uses, although planned for many years, could not be carried out during the ered by the present report.

German temperance associations, which together form the Deutsche Reichs-lle gegen den Alkoholismus, organised a second German temperance con-Düsseldorf, between June 1st and 4th, 1925, when the following subjects were l :

(a) The importance of the alcohol question for Germany's present and future ;

(b) What are the conditions to be fulfilled by the law on the campaign against alcoholism which it is proposed that the Reichstag should pass ?

(c) The truth about America.

owing upon the temperance congress, a conference on social assistance for s was held on June 4th, 1925 (*V.R.G.A.* 1925, page 361).

36th annual meeting of the German Anti-Alcohol Union was held from er 1st to 14th, 1925, at Kiel, in conjunction with the jubilee of the German r Inebriates' Homes and a course of lectures on the use of unfermented fruit

rnily and Child Welfare-including School Hygiene and Physical Culture.

Memorandum concerning the State of Health of the German Nation during 1923 l, which appeared in Germany in December 1925, gives full information on ishment and health of infants, school-children and young persons in Germany ag Document No. 1725, of January 11th, 1926).

[1] igures are incomplete or provisional.

A decree of the German Government, dated December 4th, 1924, c the general principles to be applied throughout the Reich in regard to the c form and extent of social assistance (*V.R.G.A.* 1925, page 41) states that benefit for pregnant women and women in childbirth must be considered the " subsistence minimum ".

The second course of lectures of the Association of German Communal School Doctors and Welfare Doctors was given at the Charity Home for C Marienruhe, near Hammelburg, from September 5th to 9th, 1925. It d legislation in regard to social assistance and with measures for carrying o welfare work *(Zeitschrift für Schulgesundheitspflege und Soziale Hygiene*, 1925, page 569).

In consequence of inflation, the *Zeitschrift für Säuglings- und Kleinkin* ceased to be published at the end of 1923. In August 1925 appeared the *Gesundheitsfürsorge für das Kinderalter*, and the publications of the Kaiserin Viktoria Haus, Reichsanstalt zur Bekämpfung der Säuglings- und Kleinki blichkeit and of the Deutsche Vereinigung für Säuglings- und Kleinkind (published by Georg Stilke, Berlin).

The Seventh Congress of the German Association for the Protection o and Young Children was held at Munich on March 21st and 22nd, 1925, among other things with mortality among illegitimate children during the years and with systematic measures for infant welfare.

The German Association for School Hygiene held its twentieth meeting on September 10th, 1925, the subject for discussion being " Health Welfa among Young Persons who have left school " (*Gesundheitsfürsorge für das Ki* Vol. I, No. 3, page 211).

As was pointed out above, the Reich Council of Public Health, at its m December 11th, 1925, dealt with co-operation between the various organisa assistance to tuberculous or suspect children in hospitals or otherwise. Th which were read during the meeting are published in *Gesundheitsfürsorge Kindesalter*, (Vol. I, No. 4, page 258).

Since 1923, the German Association for the Protection of Infants an Children has published, in conjunction with the affiliated centres of the Feder and the Prussian provinces, a journal entitled *Muller und Kind*, which gives tion on maternity work and the protection of infants and young children (by O. E. Staude, Osterwieck-am-Harz). Its edition " B " contains article care of small children, their feeding and education.

At the beginning of 1925, the monthly review for gymnastics, games an failed, and was replaced by the fortnightly journal *Die Leibesübungen*. It is to publications of the German Gymnastics Teachers' Union, the German Hig for Physical Culture and the German Association of Doctors for the Prom Physical Culture (published by the Weidmannsche Buchhandlung, Berlin, S

9. *Mental Hygiene.*

Full particulars regarding the number of institutions in Germany for afflicted persons will be found in Section IV.

The most recent data concerning the number of mental patients in pu private institutions for the mentally afflicted, epileptics, idiots, the feeble-min neuropaths are to be found in the " Hospital Statistics " for 1920-22 *(Medizin liche Milleilungen aus dem Reichsgesundheitsamles*, Vol. 22, No. 3).

The number of patients in these institutions was as follows :

Year	January 1st		December 31st	
	Total	Rate per 10,000 of the Civilian Population	Total	Rate per 10,000 of the Civilian Population
1920	98,814	16	103,697	17
1921	101,913	17	106,663	17
1922	106,236	17	109,552	18

egard to the death rate, there has been a considerable decrease in deaths in nstitutions since the war in comparison with the figures during the years var.

ereas, in 1917, 38,753 out of 211,294 mentally afflicted persons in institutions cent) died in consequence of bad feeding conditions, in 1922, there were only eaths out of 193,348 patients (6.4 per cent).

figures regarding the admission of alcoholic patients to establishments for tally afflicted (see page 37) are of special interest.

following table shows the number of patients admitted who were suffering oholism :

Year	Total		Per 10,000 of the Male and Female Civilian Population	
	Male	Female	Male	Female
1920	2,115	263	0.72	0.08
1921	3,654	327	1.25	0.10
1922	5,335	427	1.81	0.13

ing the years immediately preceding the war (1911-13), the number of patients l who were suffering from alcoholism per 10,000 of the civil population of both eraged 2.19 for the male and 0.19 for the female sex.

number of patients addicted to morphia and other drugs has increased during years to double the pre-war figure.

following table shows the number of persons admitted to mental establish- n account of morphinism or other forms of drug addiction :

Year	Total		Per 10,000 of the Male and Female Civilian Population	
	Male	Female	Male	Female
1920	594	252	0.20	0.08
1921	720	257	0.25	0.08
1922	805	291	0.27	0.09

average for the years preceding the war (1911-1913) was 0.11 for the male and the female sex.

following table shows the number of deaths in institutions per 1,000 persons from alcoholism :

Year	Men	Women
1920	21.9	40.8
1921	21.6	41.7
1922	18.5	43.7

—

ding the territories ceded to Poland in 1922.

IV. CURATIVE MEDICINE.

1. *Recent Developments in the Organisation and Operation of Hospitals and S*

(a) *Hospital Statistics.*—In accordance with the hospital statistics of the Reich for the years 1920-22 (Medical Statistics, *V.R.G.A.*, Vol. 22, No. 3), by the Reich Ministry of Public Health in 1925, there were, in the year 19 general hospitals with 328,197 beds ; of this total, 2,998 were public hospitals versity clinics with 288,148 beds, 821 private clinics with 11 or more be providing accommodation for 40,049 patients.

On December 31st, 1922, the number of patients in the general hospitals was of which 93,386 were men and 85,500 were women. The proportion of pat 10,000 of the civilian population was 31 at the beginning and 29 at the end The number of cases admitted was 409 in 1922, and the number of discha calculated per 10,000 of the population.

Apart from these, there were in 1922 in the German Reich, 398 lunatic (institutions for the treatment of mental diseases, epilepsy, idiocy, feeble-mi and nervous diseases) with 136,348 beds, including 239 public hospitals and sity clinics with 114,857 beds, and 159 private institutions with 21,491 be

The hospital statistics for 1922 show further that there were 139 op clinics with 5,254 beds, including 59 public hospitals and university clinics wi beds and 80 private clinics with 11 or more beds, making a total of 1,671 be number of patients in ophthalmic hospitals on December 31st, 1922, was 1,

The hospital statistics also show that, in 1922, there were 145 lying-in with 6,303 beds, including 105 public hospitals and university clinics with 5, and 40 private institutions with 11 or more beds, making a total of 900 beds. year 1922, a total of 88,596 women were confined in these institutions, of wh or 6.9 per 1,000, suffered from puerperal fever, and 173, or 2 per 1,000, died. O confined and falling ill, 28.4 per 1,000 died. In 1922, there were 12,486 confi necessitating obstetric operations in the lying-in hospitals, *i.e.*, 140.9 per 1,000 ment cases, of which 276 (3.1 per 1,000) died. The number of births was 8- which 3,733 were still-births and 1,957 infants died after birth. The numbe births per 1,000 confinements in the year 1922 was 42.1, that of premature bir

The figures given above do not include hospitals with less than 11 beds.

In regard to the private hospitals of religious communities, reference sh made to the particulars given in last year's report, which are supplemented following information in regard to the German Red Cross :

(b) *Red Cross.*—The German Red Cross Organisation (see *Was das Deuts Kreuz tut*, Berlin, February 1926) includes 6,600 local organisations, wh divided amongst the Federal States and, in Prussia, further subdivided acco provinces.

In 1925, the German Red Cross had 2,053 health detachments, nursing u sanitary units, with approximately 89,000 trained assistants. These organ have 9,236 casually and first-aid stations, permanently staffed and with a park 500 motor or horse ambulances and 17,000 other transport appliances. Duri 25, these services rendered assistance in 310,144 cases.

The Union of German Red Cross Central establishments comprised, i 56 communities with about 7,000 sisters,

The following table shows the number of institutions for in-patients ;

		Beds
144	hospitals and sanatoria with approximately	10,200
84	convalescent homes	6,000
17	educational homes	900
57	homes for the aged	1,900
18	institutions of various kinds	1,000
320		20,000

ere were also the following institutions for out-patients or cases visited in their

500 crèches, kindergartens and shelters ;
2,000 communal dispensaries, with approximately 2,400 sisters ;
2,000 consultation and social welfare centres.

Private Welfare Organisations.—The following remarks relate to the present of private welfare organisations in Germany (Publications of the Fifth Welfare 1925, No. 2).

societies, establishments and institutions for private welfare work are held to carried on by other than State or communal or social insurance organisations. the present moment there are the following seven main organisations :

1. Central Committee for Home Missions of the German Evangelical Church (51, Altensteinstr., Berlin-Dahlem), with 33 associations in the Federal States and provinces (founded 1848).

2. The German " Caritas " Society for Catholic Germany (Central Office, 18, Belforterstr., Freiburg-in-Breisgau), with 22 diocesan " Caritas " associations (founded 1897).

3. Central Welfare Office of the German Jews (2-4 Rosenstr., Berlin, C. 2), with 3 societies in the Federal States, 6 provincial societies and 23 local branches (founded 1917).

4. The German Red Cross (4 b, Corneliusstr., Berlin, W. 10) (founded 1864).

5. The Fifth Welfare Society (13-14, Oranienburgerstr., Berlin, N. 24) has developed out of the Union of Free Private General Hospitals and Sanatoria in Germany and includes all free welfare institutions which are not denominational or which do not belong to the Red Cross or the Workmen's Welfare Committees : 15 Federal State and 10 provincial branches (founded 1920).

6. Central Committee for Workers' Welfare (3, Lindenstr., Berlin, S.W. 68). The object of this society is to increase co-operation of the working classes in social welfare (founded 1919).

7. The Central Welfare Committee of Christian Workers (25, Kaiser-Allee, Berlin-Wilmersdorf) consists half of Christian trades-union representatives and half of representatives of denominational trade organisations (founded 1922).

hospitals and sanatoria controlled by the following five headquarters orga-s : Home Mission, " Caritas ", Central Welfare Office of German Jews, Red ie Association of Free Private General Hospitals and Sanatoria of Germany—nated in 1919 to form the Reichsverband der privaten gemeinnützigen Kranken-egeanstalten. This union took part in the foundation in 1920 of the Wirt-und gemeinnütziger Wohlfahrtseinrichtungen Deutschlands (19, Dorotheenstr. W.) and of the Hilfskasse gemeinnütziger Wohlfahrtseinrichtungen Deutsch-3-14, Oranienburgerstr., Berlin, N. 24) (founded 1923).

In March 1925, the central organisations (Home Mission, "Caritas", Welfare Office of German Jews, Fifth Welfare Society and the Central Welfa mittee of Christian Workers, together with the Red Cross) amalgamated German League for Free Welfare (13-14, Oranienburgerstr., Berlin, N. 24). same time, the Reichsgemeinschaft von Hauptverbänden der freien Wohlfah (founded in 1923) was dissolved.

2. *New Regulations relating to Medical Education.*

New regulations in regard to medical examinations throughout the Germ were issued in a decree of the Ministry for the Interior of July 5th, 1924 (V 1924, page 606), and the various Federal States issued corresponding regula their execution.

Prussia, in a ministerial decree of April 25th, 1925 (*V.R.G.A.* 1925, pa issued further instructions for carrying out the above regulations to the cha the committees for medical preliminary and advanced examinations.

Bavaria issued new regulations for medical examinations for doctors in t Service on January 7th, 1925 (*V.R.G.A.* 1925, page 99). The examination is ted by a committee of five members and consists of written, practical and o

The German Reich also issued new regulations for veterinary examinati proclamation of the Reich Minister of the Interior dated August 21st, 1925 (V 1925, page 781).

In Wurtemberg, a law of August 3rd, 1925 (*V.R.G.A.* 1925, page 735), int public medical associations to represent the interests of doctors, dentists, ve surgeons and chemists.

In most of the German States, the training of women welfare workers is r by law. There are at the present time 29 officially recognised welfare training of which 17 are in Prussia, 3 in Saxony, 1 in Wurtemberg, 4 in Baden, 1 in H 1 in Mecklenburg-Schwerin, 1 in Bremen and 1 in Thuringia. The complet in a welfare training school lasts two years.

The Prussian regulations of October 22nd, 1920 (*V.R.G.A.* 1921, page 4), ing the State examination of women welfare workers were supplemented by terial decree of July 10th, 1925 (*V.R.G.A.* 1925, page 611).

The school for welfare work among the young at 6, Schinkelplatz, Berlin started a post-school course of social preparation of welfare workers for t examinations, lasting from November 1925 to February 1926 (*V.R.G.A.* 1925, pa

The training and State examination of *sick-nurses* take place in nursing under Government inspection and last on an average one year. In Prussia, T and Brunswick, however, the period of training is two years. In Hamburg an lenburg-Strelitz, one year's practical experience in nursing is required as a pre to entering for the one-year's course of training.

A State examination for midwives has been introduced in Hamburg, Bre Hesse. In Hamburg and Bremen the training lasts one year.

For infants' and young children's nurses, two years' training in one of t schools for infants' nurses is required in order to qualify for admission to t examinations in Prussia, Thuringia, Hamburg, Brunswick and Oldenburg. there were in Prussia 64 schools for infants' nurses. In Bavaria, Saxony, W berg, Baden, Hesse, Mecklenburg-Schwerin, Mecklenburg-Strelitz and Bre course of only one year in a school for infants' and young children's nurses is ne Anhalt and Lübeck require only a six-months course.

In Prussia, a decree of August 11th, 1922, regulated the conditions for the and State examination on the care of infants and small children for teachers ap

ntary and secondary girls' schools. The training consists of a three-months n appropriate children's hospitals or infants' homes. In Wurtemberg, the l teachers must take a course of one month's training in an infants' home. a decree of February 3rd, 1925, *Saxony* laid down regulations for the training mination of State certificated teachers of medical gymnastics (*V.R.G.A.* ge 205). In Dresden, a course of one and a half year's training is provided in e Institute for Medical Gymnastics and Massage. The examination includes gymnastics and massage, general health, care of sick persons and infants, on of infectious diseases, first aid in accidents and cases of poisoning, and the s of social hygiene.

iber of Doctors and Medical Students.

re has been no official census of doctors in the whole German Reich since n annual census is, however, in contemplation. According to the list of belonging to the Association of Doctors in Germany, the total number of in Germany, including the Saar Territory, was estimated by Prinzig . *Med. Wochenschrift*, 1926, No. 12, page 498) at 41,650 on June 1st, 1925. ire refers almost exclusively to doctors in practice.

1925, there were 6.6 doctors per 10,000 inhabitants, as compared with 5.99 and 5.02 in 1911.

number of medical students at German universities has continued to decrease. wenty-three German universities and at the Medical Academy at Düsseldorf, l number of registered medical students in the winter term of 1924-25 was en and 1,328 women, not including dental students, who numbered 708 men women. The corresponding figures for the winter term of 1923-24 were 9,217 l 1,521 women. The dental students numbered 1,334 men and 231 women *A.* 1925, page 790).

number of medical candidates who received their doctor's degree in 1922-23 52, of whom 81 were foreigners, 37 inhabitants of Alsace-Lorraine, and the mber of women 347. In addition, 4 foreigners were granted a doctor's degree having to take the medical examination or do the year's practical training *A.* 1926, page 279).

ween October 1st, 1923 and September 30th, 1924, degrees were conferred 518 doctors, 660 dentists, 465 chemists and 21 analytical chemists for food- *V.R.G.A.* 1925, page 704).

V. GENERAL.

islation regarding Foodstuffs and Articles in General Use.

following laws have been promulgated :

German Reich.

Circular of the Reich Minister of the Interior, dated January 8th, 1925, g the importation of sulphurised wines from France to which French legisla- pplicable (*V.R.G.A.* 1925, page 189).

Decree of the Reich Minister of the Interior, January 27th, 1925, for the n of the law regarding the examination and certification of clinical thermo- (*V.R.G.A.* 1925, page 109).

3. Law of March 21st, 1925, by which German Reich signified its adhe the Madrid Treaty regarding the suppression of false indications of the origin (*V.R.G.A.* 1925, page 386).

4. Decree of the Minister of the Interior, June 6th, 1925, containing pr relating to the Wine Law with reference to the designation of sparklin (*V.R.G.A.* 1925, page 457).

5. Decree of September 16th, 1925, regulating the concellation of te import facilities in regard to meat (*V.R.G.A.* 1925, page 812).

6. Decree of December 11th, 1925 (*Reichsgesundheitsblatt*, 1926, page 3) ting the sale of chocolate in tablets.

7. Proclamation of December 1st, 1925 (*Reichsgsundheitsblatt*, 1926. publishing provisions for the execution of a fresh text of the Wine Law.

(b) *Prussia.*

1. Decree of the Minister for Agriculture, October 28th, 1924 (*V.R.G.* page 1), and of the Minister of Public Welfare, November 26th, 1924 (*V.R.G.* page 166), dealing with the causes of meat poisoning and the means of preven

2. Ministerial decree, December 31st, 1924, prohibiting the use of meat containing boric acid (*V.R.G.A.* 1925, page 111).

3. Ministerial decree, March 2nd, 1925 (*V.R.G.A.* 1925, page 374), with the sale of tinned milk.

4. Ministerial decree concerning the preservation of milk, March 5t (*V.R.G.A.* 1925, page 359), prohibiting for the future, in principle, the treat skimmed milk and full-cream milk with hydrogen peroxide for purposes of p tion.

5. Ministerial decree, June 19th, 1925 (*V.R.G.A.* 1925, page 579), deali the adulteration of spirits of wine.

6. Ministerial decree, July 17th, 1925 (*V.R.G.A.* 1925, page 711), prohibi use of flour in the making of all mayonnaise and limiting the proportion of flou may be added to meat salad to 1 per cent. The addition of benzoic acid salad is illegal if it exceeds 0.125 per cent, and to mayonnaise if it exceeds 0.25 p

7. Ministerial decree, July 20th, 1925 (*V.R.G.A.* 1925, page 712), pro the sale of Gorgonzola che se with a rind containing barium sulphate.

8. Ministerial decree, August 7th, 1925 (*V.R.G.A.* 1925, page 609), down uniform regulations for the designation of coffee and coffee mixtures.

9. Ministerial decree, August 24th, 1925 (*V.R.G.A.* 1925, page 724), co general regulations for carrying out investigations into the amount of wat locally or by districts as the maximum which may be added to meat extracts a sausages for cooking.

10. Ministerial decree, October 31st, 1925 (*V.R.G.A.* 1925, page 956), reg the amount of boric acid which may be added, for purposes of preservation, to preserved fish and what are known as fresh shrimps.

11. Ministerial decree, November 14th, 1925 (*Reichsgesundheitsblatt*, 192 3), cancelling as from May 1st, 1926, the exceptional permit granted for the add boric acid to pastry and confectionery.

2. *Legislation regarding the Control of Pharmaceutical Products.*

(a) *German Reich.*

1. Circular of the Reich Minister of the Interior, August 18th, 1924, re the sale in pharmacies of potent drugs, according to which Santonin pastill

ing not more than 0.05 grammes of Santonin, may once more be sold in phar- without a medical prescription (*V.R.G.A.* 1925, page 345).

Decrees of the President of the Reich, December 9th and 24th, 1924, regar- e sale of drugs (*V.R.G.A.* 1925, page 45), containing, under heading C, a list of rmaceutical products which must not be sold except by pharmacies.

The third edition of the German Tariff of Pharmaceutical Products of 1924 n superseded by the German Tariff of Pharmaceutical Products of 1925, which t into force by the Federal States (*V.R.G.A.* 1925, page 44) with effect as nuary 1st, 1925.

Proclamation of the Reich Minister of the Interior, February 12th, 1925, ng the export of narcotics providing that a Chinese import licence must accom- ny declaration in regard to the export of narcotics to China (*V.R.G.A.* 1925, 3). Corresponding proclamations were issued on May 23rd, 1925, in regard to and Portugal (*V.R.G.A.* 1925, page 445) ; on July 14th, 1925, in regard to land ; on September 16th, 1925, in regard to Ireland, Luxemburg and Hungary ; November 17th, 1925, in regard to Italy and Palestine.

Decree of the President of the Reich, March 27th, 1925 (*V.R.G.A.* 1925. 5), laying down that preparations which may not be sold except at pharmacies lso not be issued by sickness insurance offices, associations or societies to embers.

Decree of the Reich Minister of the Interior, November 13th, 1925 (*V.R.G.A.* age 905), regulating the supply of narcotics to merchant-ships.

Prussia.

Ministerial decree, December 19th, 1924 (*V.R.G.A.* 1925, page 47), amending ice regulations in regard to the sale of secret remedies and similar medicines.

Proclamation, December 19th, 1924, extending to insulin and arecolin and s the regulations regarding the sale of potent drugs (*V.R.G.A.* 1925, page 111).

Ministerial decree, December 23rd, 1924 (*V.R.G.A.* 1925, page 110), regula- e use of hydrocyanic acid and its derivatives for the destruction of parasites : e of April 7th, 1925 (*V.R.G.A.* 1925, page 398), similarly deals with " Zyklon B ".

Ministerial decree, March 13th, 1925 (*V.R.G.A.* 1925, page 489), amending ussian pharmacy regulations in regard to supplies for hospital dispensaries.

Ministerial decree, October 19th, 1925 (*V.R.G.A.* 1925, page 956), draws the on of the public to infections through the bacilli of mice—and rats—typhoid.

Police regulation, September 8th, 1925 (*Reichsgesundheitsblatt*, 1926, page gulating the sale of poisonous products for the protection of plants by depots official services for the protection of plants and by agricultural corporations.

ne State and Housing Questions.

s in last year's report, the statistics on housing cover the whole of the 86 com- with more than 50,000 inhabitants (excluding Saarbruck) (see *Wirtschaft und k*, 1925, pages 345, 586 ; and 1926, page 200 ; also the *Vierteljahrshefte zur Sta- es Deutschen Reichs*, 1926, Part I, 35th Year).

hereas, in 1923, more than 41,000 new dwellings were provided in the communes stion, in 1924 only about 27,000 new dwellings could be occupied in spite of ed activity in the building trades. The number of completed dwellings fell, ore, from 1923 to 1924, by 34 per cent.

he following table shows the net increase of new buildings and dwellings in all mmunes with over 50,000 inhabitants.

Year	Total Buildings	Dwelling-houses	Sets of Apartments
1924	16,225	8,996	27,
1925	26,241	16,006	50,

In 1925, there was a substantial increase in building operations in com with the previous year. In the 86 communes with more than 50,000 inhabit increase, as compared with 1924, was 62 per cent in regard to total buildings a cent in regard to dwelling-houses. The proportion of dwelling-houses to number of buildings rose, in the large cities, from 53 per cent in 1924 to 61 The number of sets of apartments also showed an increase of 86 per cent, as c with the previous year (approximately 50,000 in 1925, as compared with 27,000

The average number of dwellings built, in all the large towns taken amounted in 1925 to 2.6 per 1,000 inhabitants (1.4 in 1924). Activity in the trade increased more or less regularly from quarter to quarter and was par marked in the last quarter.

The number of licences to build increased steadily from the beginning until May-June, but since July 1925 it has fallen off considerably. In the ma communes with over 100,000 inhabitants licences to build new dwelling-hou granted during 1925 far in excess of the actual number of houses complete the year. On the other hand, the increase in building licences in the towns of size gives no reason to expect an increase in building operations for the begi 1926 over the corresponding period in 1925.

The size of the flats constructed in 1924 and 1925 varied considerably acco time and place. In the communes with over 100,000 inhabitants, medium-siz with four rooms preponderated. The proportion of small flats with one to thr to the total number of buildings fell from 30 per cent in 1924 to 22.6 in 192 the proportion of five-roomed flats rose from 16 per cent to 21 per cent.

In contrast to the larger towns, the new flats in the communes with 5 thousand inhabitants were considerably smaller. The average size of the n may be reckoned at about 4 ½ rooms per flat in the large towns and 4.4 to 4. medium-sized towns (*Wirtschaft und Statistik*, 1926, page 204).

4. *Public Health Propaganda.*

The German Health Museum at Dresden continued during 1925 to play a tant part in regard to public health propaganda.

For purposes of health instruction in schools, a collection of illustrati published on the following subjects : infant care, tuberculosis, venereal disease trial hygiene and protection of workers, temperance and physical culture ; and, two diagrams were prepared of infectious diseases of children. The collecti obtainable from the Gesellschaft für Hygienischen Lehrbedarf, 38-40, Zi Dresden A.1.

The Deutsche Hochbildgesellschaft (5, Rheinbergerstr., Munich) produ scientific explanatory plaster tables in relief, illustrating various branches o health and including representations of skin and venereal diseases, the chief vo diseases and certain pathological specimens, *e.g.*, of pulmonary tuberculosis.

Extensive popular health propaganda was carried out by the Reich Co for public instruction on health during the Reich Health Week in April 1926.

Attention must also be drawn to the large " Gesolei " exhibition of healt welfare and physical culture at Düsseldorf.

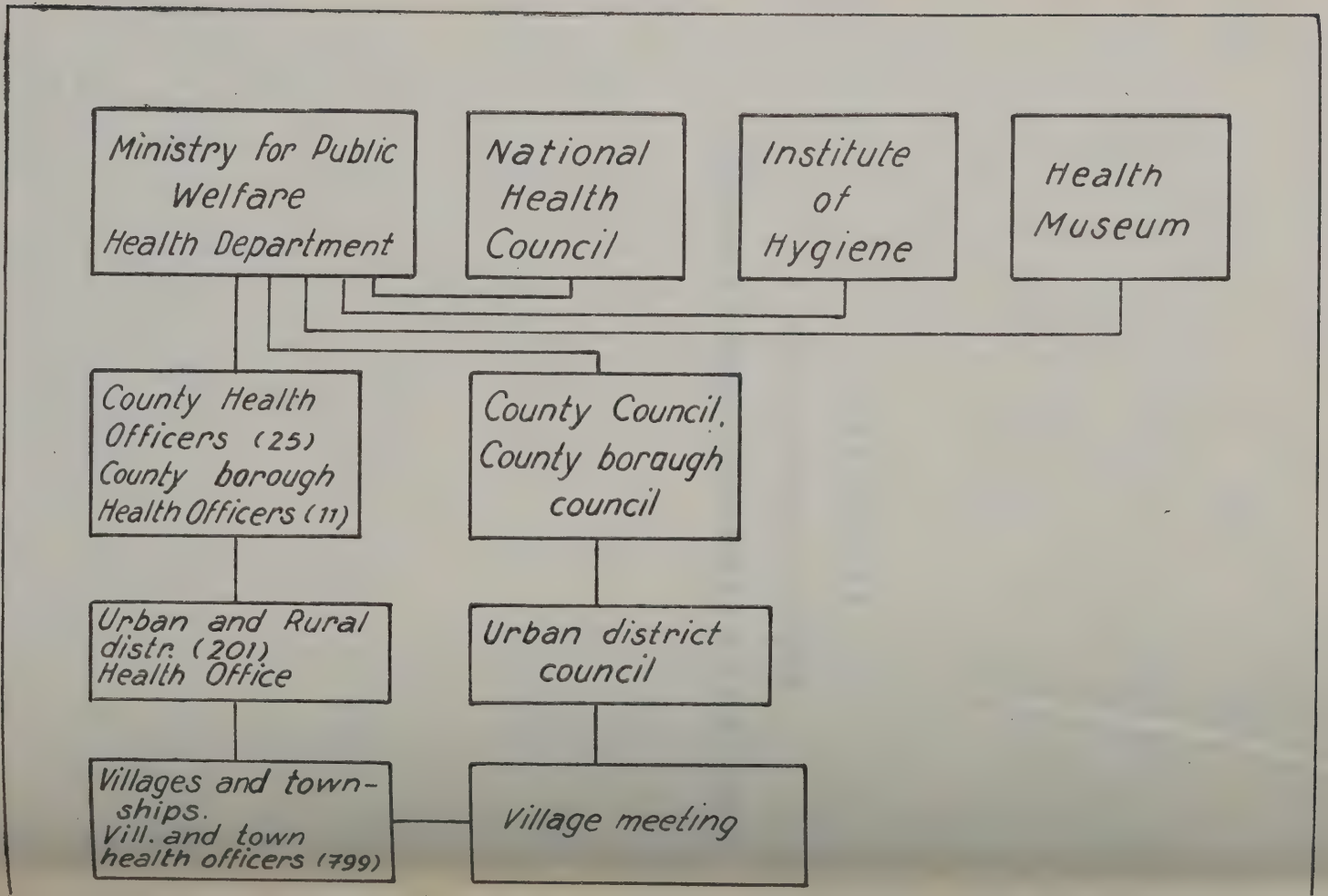
August 1926.

HUNGARY

Report prepared by the

SANITARY REFORM BUREAU (Budapest)

Health Organisation of Hungary


Ministry for Public Welfare Health Department
National Health Council
Institute of Hygiene
Health Museum
County Health Officers (25) County borough Health Officers (11)
County Council, County boraugh council
Urban and Rural distr. (201) Health Office
Urban district council
Villages and town-ships. Vill. and town health officers (799)
Village meeting

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I. GENERAL INTRODUCTION.

a.

916 square kilometers.

ulation.

34,635 inhabitants (estimate for the end of 1925).

rtality.

(a) GENERAL MORTALITY RATE.

e total number of deaths registered in 1925 was 140,351, which gives a mortality 16.9 per thousand. In the most important urban districts with a total ion of 1,545,195 inhabitants, the mortality rate was 17 per thousand. The mortality rates were at Baja, a town of 19,103 inhabitants (24.3 per thousand), Pécs, a town of 47,022 inhabitants (22.2 per thousand). The lowest mortality s found in Sopron, a town of 36,042 inhabitants (13.6 per thousand). The ate of the city of Budapest, of which the present population is 927,035, is lly equal to that of the other large Hungarian towns (17 per thousand).

e death rate in rural districts—including small towns—with a total popu- f 6,819,458 inhabitants, was 16.8 per thousand. The lowest mortality rate the western part of the country (on the right bank of the Danube) : 16 per d ; and the highest mortality rate in the eastern part (on the left of the river 19.2 per thousand.

(b) DISTRIBUTION OF DEATHS ACCORDING TO SEASON, 1925.

Month	Deaths	Percentage of Total Deaths for the Year
January	12,504	8.9
February	11,439	8.1
March	12,946	9.2
April	13,298	9.5
May	13,381	9.5
June	11,030	7.9
July	11,784	8.4
August	11,531	8.2
September	10,501	7.5
October	10,556	7.5
November	9,938	7.1
December	11,743	8.4

(c) DISTRIBUTION OF DEATHS ACCORDING TO AGE-GROUPS, 1925.

Age	Deaths	Percentage of Total Deaths
0-7 years	52,146	37.2
7 years and over	88,205	62.8

(d) DISTRIBUTION OF DEATHS ACCORDING TO PRINCIPAL CAUSES.

(Data only available for groups of more than 10,000 inhabitants out of a tion of 3,250,224.)

Disease	Deaths
Congenital debility	3,923
Apoplexy	2,756
Organic cardiac affections	4,964
Pneumonia	4,615
Cancer	3,496
Other natural causes	20,614
Violent deaths and accidents	1,019
Suicides	1,432
Murders	115
Other violent deaths	291

4. *Births.*

(a) BIRTH RATE.

In 1925, 230,061 live births were registered, giving a birth rate of 2 thousand, and 6,480 still-births (2.7 per cent of the total births).

(b) GEOGRAPHICAL DISTRIBUTION OF BIRTHS.

The highest birth rate (33.8 per thousand) was in the eastern part of the (on the left of the river Tisza), the lowest rate (25.6 per thousand) in the ce the country between the Danube and the Tisza. Among the towns of impo Kecskemét (76,876 inhabitants) showed the highest birth rate : 29.1 per tho and Sopron (36,042 inhabitants) the lowest birth rate : 20.2 per thousand. I pest, the birth rate was 18.6 per thousand.

(c) SEASONAL DISTRIBUTION OF BIRTHS, 1925.

Month	Births	Birth Rate Per cent
January	17,496	25.6
February	17,683	25.8
March	20,769	30.4
April	—	—
May	—	—
June	18,466	26.8
July	20,004	29.0
August	20,548	29.8
September	19,972	29.8
October	19,762	28.1
November	17,882	26.3
December	16,594	23.6

5. *Infant Mortality*, 1925.

The number of deaths from 0 to 1 year amounted to 38,534, which rep an infant mortality of 167 per thousand.

SEASONAL DISTRIBUTION OF INFANT MORTALITY:

Month	Deaths	Rate of Infant Mortality Per thousand
January	3,429	196
February	2,949	167
March	3,070	148
April	3,167	158
May	3,459	166
June	2,820	153
July	3,965	198
August	3,947	192
September	3,155	159
October	3,125	158
November	2,652	148
December	2,796	169

e Budget for the Fiscal Year 1925-26.

	Crowns
al Expenditure	7,067,300,000,000
istry of Public Welfare	638,904,660,000
tral Administration	24,409,480,000
lth Administration	295,152,320,000

expenditure provided for under the heading "Health Administration" analysed as follows :

I. PUBLIC HEALTH

(a) *Ordinary Expenditure*

	Crowns
treatment of indigent patients	20,322,473,000
to municipalities for medical relief for the poor	195,827,110,000
gn against infectious diseases	6,132,000,000
gn against social diseases	3,139,000,000
upply	197,570,000
st course for public health officers	73,000,000
al training of nurses and midwives	730,000,000
insurance of State officials	4,380,000,000
.. ..	14,600,000
Total of Ordinary Expenditure	230,815,753,000

(b) *Extraordinary Expenditure*

	Crowns
ion of public hospitals other than those of the State; allation of anti-venereal dispensaries; Creation and allation of anti-tubercular dispensaries	6,358,547,000
penditure for "Public Health"	237,174,300,000

II. PUBLIC HEALTH INSTITUTIONS.

(a) *Ordinary Expenditure.*

National Health Council	84
Health inspectors	461
State hospitals and lunatic asylums	50,855
Central Bacteriological and Sanitary Research Institute; National Institute of Hygiene	625
Total	52,026
(b) *Extraordinary Expenditure*	5,952
Total Expenditure for Public Health Institutions	57,978

II. HEALTH ADMINISTRATION AND LEGISLATION: DEVELOPMENTS IN 1925.

As the efforts of the nation have been concentrated on the economic res of the country, health legislation made little progress in 1925. The Convention between Hungary and Austria was modified and the reciproca cation of cases of infectious disease observed in the frontier districts of th countries was provided for by special decrees.

The Government published the Convention dealing with the campaign plague concluded in the course of the preceding year (Decree No. 16, 1925).

Among the most important legislative measures we should mention the fo

Law No. 31 of 1925 creating an Institute of Public Health.

Decree relating to the prophylaxis of typhus and typhoid fever.

Ministerial Decree No. 58,274, 1925, classing malaria among the diseases r compulsory notification (this disease only occurs sporadically in Hungary

Ministerial Decree No. 65,057, 1925, instituting the compulsory ha inspection of all factories and workshops by officials of the Public Health These officials will forward a report to the public health officers of the dep on their inspections and the latter will transmit these reports to the Minister Welfare together with its observations.

This decree puts an end to the already long-standing controversy betv health and industrial authorities, and allows the health authorities to in the sanitary conditions of factories and workshops and to make the al required in the interests of public health ; the effects of this new provi already noticeable.

The decree of the Minister of Agriculture No. 19,000, 1925, instituting supervision of the milk industry.

Ministerial decree regulating the practice of medical optics.

The Government has devoted special attention to health propaganda ; in progress has been made in this direction by the establishment of a Sanitary Bureau with the financial assistance of the Rockefeller Foundation (De 44,433, 1925, of the Minister of Public Welfare).

Decree No. 117,610, 1925, of the Minister of Finance. This decree the State of responsibility for expenditure on the treatment of patients and tection of children, and assigns this to autonomous organisations.

The Minister of Public Welfare has published a list of specialists, drav 1924.

cree of the Ministry of Public Welfare No. 80,700, 1925. This decree abrogates visions according to which, in view of the already adequate number of pharma- Hungary, no further authorisation for the opening of a pharmacy was to be and simplifies the formalities for obtaining letters patent.

nisterial Decree No. 2,900, 1925. This decree, relating to the pensions of disabled in the war, their widows and orphans, suppresses the pensions of htly disabled and increases by that amount those of the seriously disabled. enacts that certain employments shall be reserved for certain pensioners in f their pensions.

III. INFECTIOUS DISEASES[1].

nerally speaking, the mortality from infectious diseases has been lower than preceding year.

Malaria has been added to the list of diseases the notification of which ulsory.

Dick's reaction and inoculation against *Scarlet Fever* have been applied ge scale. When the harmless nature of this practice was recognised, a private on was authorised to manufacture and sell the necessary biological products tate supervision. In spite of the good results obtained, inoculation against fever has not yet been made compulsory.

The following figures are taken from the report of the Royal Hungarian f Statistics :

DEATHS FROM INFECTIOUS DISEASES, 1924-25.

	1924	1925
Smallpox	10	14
Typhus	43	6
Typhoid and paratyphoid fever	1,365	1,088
Dysentery	926	413
Diphtheria	555	588
Scarlet fever	495	562
Measles	423	574
Whooping-cough	750	686
Puerperal fever	280	261
Tuberculosis	25,758	19,977
Influenza	857	488
Anthrax	84	68
Total	31,546	24,725

IV. SOCIAL DISEASES.

erculosis.

tality from tuberculosis has shown a striking decrease in 1925. This decrease s been general in Europe this year, has been nowhere so marked as in Hungary.

—

le showing the number of cases of notifiable diseases and the number of deaths caused by these disease Hungary in 1925 is to be found in *Epidemiological Intelligence*, No. 10, page 129.

DEATHS FROM TUBERCULOSIS IN HUNGARY, 1924-25.

	Deaths	Mortality per 1,000 Inhabitants
1924	25,758	3.2
1925	19,977	2.4

DEATHS FROM TUBERCULOSIS IN BUDAPEST.

	Deaths	Mortality per 1,000 Inhabitants
1924	3,227	3.3
1925	2,361	2.5

The reasons for the decrease in mortality from tuberculosis are probably

(a) A slight improvement in the diet of the population ;

(b) The fact that numerous persons who had contracted the disease the war were already dead.

The campaign against tuberculosis was pushed forward with great energ Hungarian Red Cross Society and the National Society of Public Health ca an intensive propaganda by means of several hundred popular lectures. The Committee for the Campaign against Tuberculosis distributed hundreds of th of tracts, as a result of which there has been a notable increase in the att at anti-tuberculosis dispensaries.

The campaign against tuberculosis has been greatly helped by the fo of new institutions. The National Workmen's Sickness Insurance Fund in 1925 two hospitals of 80 and 200 beds respectively. The Queen Elizabe torium has been enlarged ; it has at present 530 beds. A third large ward f cular patients was opened last year in Budapest. This ward is equipped modern improvements and contains 620 beds : 395 for patients suffering fron nary tuberculosis, 200 for cases of surgical tuberculosis, and 25 for tubercular women.

The promoters of the anti-tuberculosis campaign have devoted special a to the protection of children. The National " Stephania " Association, w more than 100 dispensaries, co-operated actively in the work for the preve tuberculosis among infants and young children. The National League for tection of Children deals with older children and has taken effective steps the spread of tuberculosis by sending hundreds of underfed children to spe weeks in summer camps.

2. *Cancer.*

DEATHS FROM MALIGNANT TUMOURS 1923-24.

	1923	1924
Cancer	5,939	5,961
Other malignant tumours ..	662	681
Total	6,601	6,642

Hungary is taking an active part in the world campaign against malignant The Royal Hungarian Society of Surgeons has appointed a Cancer Comm collect statistical data, to enlighten the public in regard to the early sym cancer and to carry on cancer research.

An institute for the treatment of malignant tumours has recently been

ereal Diseases.

Committee for the Campaign against Venereal Diseases of the National ion of Public Health began its work, with the assistance of the Ministry c Health, in 1925. This Committee has considered the question of compulsory examination before marriage ; it recommended that medical students should more advanced instruction on subjects relating to sexual life, and the organisa- popular lectures on venereal diseases and their prophylaxis in the higher hnical schools. The Ministry of Public Health has been asked to study the n of congenital syphilis and to take the steps necessary for increasing the of beds allocated to venereal cases. The Committee has also drawn up for the collection of statistical data relating to venereal diseases—a plan s at present in process of execution. The total number of beds allocated in ital to patients suffering from venereal diseases amounts to 1,401.

choma.

Health Administration was informed through the reports of public health and communications from the Oculists' Association that the frequency of a had increased along the new frontier of the country and that it had appeared n districts where it was previously unknown. Strict supervision was exercised rontiers to prevent the importation of new cases, and the Minister ordered nological examination of the population on as extensive a scale as possible iew to discovering the precise situation with regard to trachoma in the country. s examination covered :

(a) All previously reported cases of trachoma ;
(b) All school-children ;
(c) All boarding or day pupils of public institutions, orphanages, as well as children in public crèches ;
(d) All prisoners and all persons detained in reformatories and lunatic asylums ;
(e) All workers in factories and workshops ;
(f) All persons living in the same dwelling as the persons mentioned under paragraphs *(b)* and *(e)*.

examination was entrusted to the local health authorities and the results, v in strongly contaminated districts, were verified by specialists appointed Ministry.

final result of the examination will be published when this verification is . The examination of the school-children showed that approximately ent of them were suffering from trachoma. The territories most seriously are those where the disease already existed before the war. It has, however, n root in districts where it was formerly entirely unknown. The necessary re taken in order that all persons suffering from trachoma should be ically treated.

holism.

energetic campaign undertaken, with the assistance of the Government, National Temperance Committee was brought to a complete standstill by l war. The Government of the Hungarian Union of Soviets, which was only for a short period, established a system of total prohibition, which, however, r applied. At present, the Ministries of Social Welfare and Public Health

are making serious efforts to stimulate and encourage the anti-alcoholic c carried on by various social and charitable organisations, thus promoting th tion of all temperance organisations under a central committee : " The L Temperance Organisations ", which carries on its work under the direct su of the Ministry. The Ministry drew up a plan of action for these associat published a pamphlet entitled *What should be the Attitude of the Governmer Society to Alcoholism ?* Through the Sanitary Reform Bureau, the Minis duced a propaganda film, distributed illustrated cards and posters and for popular lectures to be given. The central Health Administration has two important draft laws for the campaign against alcoholism ; unfortunate bills were defeated, owing to the opposition of the Ministry of Finance. provided for the prohibition of the sale of alcoholic beverages to young people second allowed the communes to introduce a system of local prohibition. meantime, the wine industry went through a crisis of exceptional gravity. possesses approximately 155,000 hectares of vineyards, and the export Hungarian wine decreased to such an extent that the consumption of wine wa considered a patriotic duty. In 1914, Hungary consumed 40.5 litres of wine of the population ; the total consumption of various spirits amounted to 4.9 head ; the consumption of whisky alone, which amounted before the war to per head, had fallen to 1.04 in 1924 and 0.3 in 1925. The central Public Healt fully realises its responsibilities and does everything in its power to fight alc The traditional habit of drinking has recently been attacked in many public and an energetic campaign has been inaugurated.

V. PREVENTIVE MEDICINE AND HYGIENE.

1. *Protection of Mothers and Infants.*

The National " Stephania " Association is responsible for the protection of and infants, under the supervision of the Ministry of Social Welfare.

This Association, which began its work in 1921, possesses a central ins Budapest, 96 dispensaries, 10 milk-distributing centres and 91 branch establ working in co-operation with the dispensaries. By the end of 1925, the orga of the " Stephania " Association was almost complete in all districts of m 15,000 inhabitants. It employs 178 doctors and 367 specially trained nurs salaries of the doctors and nurses of the Association and its printing expenses by the Government ; the upkeep of the dispensaries (heating, lighting and is borne by the communes ; while the food, clothing, etc., distributed are by the local branches of the Association.

The Central Institute directs the organisations for the whole countr responsible for the technical training of the nurses. It also forms a centre for demonstration, co-ordinating the work of all the institutions for the p of mothers and infants.

The work of the protection of mothers and infants is carried on chiefl dispensaries, which do the following work :

(a) Protection of maternity, beginning between the sixth and seventh of pregnancy and ending with convalescence. — The protection of mothers is more difficult by the fact that the dispensaries only deal with mothers w for assistance.

(b) Protection of infants and young children from birth to the en third year.—The office of the Registry of Births is required to communica

aries all live births taking place in its area ; consequently, the dispensaries present with 80 per cent of all newborn children.

Social work.—This work consists in educating the people by a sane propa- and preventing the evils caused by ignorance and superstition, bad habits, iseases and immorality.

1925, the Association dealt with 1,107 pregnant women, 49,267 children of n one year and 55,299 children from 1 to 3 years. The doctors of the Associa- e their advice in 209,315 cases and the nurses made 565,864 visits to the homes hildren ; the dispensaries gave 2,316 complete layettes and distributed clothes cases and food in 23,061 cases ; they also furnished other kinds of assistance cases, lent the outfit necessary for confinements in 897 cases, and finally sistance by means of the social service in 27,749 cases.

following data relating to the results of the work for the protection of mothers nts in Hungary in 1925 has been communicated by the Central Office of s :

mber of live births in 1925, 230,061. Deaths of children from 0 to 1 year, rate of infant mortality 16.8 per cent). In that part of the country where the aries are already in operation, the number of live births amounted to 60,966 of deaths of children under 1 year of age to 8,764, which gives a rate of infant y of 14.4 per cent—or 2.4 per cent less than in the whole country. The f the work of the dispensaries are even more striking considering that the infant mortality in districts where dispensaries have not yet been organised per cent—or 3.2 per cent more than in areas where the dispensaries are in n. These results are due to the fact that the dispensaries have dealt with hildren—or 80.1 per cent of the 60,966 live births which have taken place heir district and 21.4 per cent of all the newborn children in Hungary. th rate of children looked after by the dispensaries was only 7.7 per cent. pite the low mortality in areas where the dispensaries are working, the infant y in the whole Kingdom was 14.4 per cent ; 30 to 40 per cent of the inhabi- pecially in rural districts, do not live in groups but in isolated farms more or of reach of medical assistance, because of the great distances to be covered and equate means of communication. Infant mortality in these rural districts 25 to 35 per cent, which naturally counterbalances in the statistics the good btained in larger communities.

tistical data also show that the dispensaries have brought about an increase umber of live births, although the organisation for the protection of mothers t complete. In 1925, the number of live births rose to 15,143—or 7 per cent an in 1924. The distribution of the excess of births shows that it was 8.7 in areas provided with dispensaries and only 6.5 per cent in areas where not yet exist.

se results are, at any rate partly, due to the propaganda work of the dispen- For each dispensary, in addition to its protective work, carries out educational nda work by means of pamphlets, manuals, lantern slides and films supplied entral Institute. This propaganda work is greatly assisted by the establish- the whole country of "schools for future mothers", and by courses of l training for midwives.

l Welfare.

protection of children by the State—as distinct from the protection of mothers nts—showed progress in several directions in 1925 : reorganisation os

overcrowded orphanages, better care of children affected with physical disabi placing of children requiring more strict supervision, and prolongation of t of detention in the orphanages. Measures to prevent overcrowding in the or were rendered possible by the fact that the allowances for the children have bee up to the pre-war level and paid punctually. According to the terms of ministerial decree, children under 2 years receive an allowance of 200,000 those from 2 to 7, one of 150,000 crowns ; and from 7 to 12, one of 120,00 They further receive an allowance in kind in the form of clothes and footwea quality.

Steps have also been taken to withdraw from the orphanages mentally cally defective children.

A medico-pedagogic institution has been established for mentally children. This establishment has been housed in the former building of t orphanage at Guyla. Children suffering from physical defects have been the war orphanage at Szekesfenervar, Vác and Ikervar, where they receive v training.

Decree No. 2,000, 1925, recognises the situation of morally neglected and organises a preventive campaign against juvenile crime.

This decree lays down that the period spent by children in the orphana be prolonged up to their eighteenth year (instead of their fifteenth), when their or mental development renders this desirable.

The same decree extends the sphere of activity of the State in the matte welfare by placing crippled or weak-minded children on the same footing as neglected children ".

The number of children dealt with by the State organisation for the p of children amounted to 35,540 at the end of the year 1925.

VI. CURATIVE MEDICINE.

1. *Hospitals and Medical Treatment.*

Enlargements and improvements were made in 1925 in the following h

" Uj Szent Janos " municipal hospital, Budapest : construction of thr for tuberculous patients.

" Skekesferevar " municipal hospital : inauguration of obstetrical de of 35 beds.

" Csorna " municipal hospital : installation of a section for the treatment diseases.

White Cross Infant Hospital, Budapest : establishment of a section fo

Bethesda Hospital, Budapest : reopening of surgical section.

Reopening of the Sarvar hospital, 80 beds.

Transformation of the three private hospitals of Kalocsa, Halas and Ce public hospitals. These establishments have at their disposal a total n 115 beds.

Opening of three private sanatoria, two of which, at Zalaegerszeg and Hü belong to the Workmen's Insurance Fund, and a hospital for tuberculosis balint. These establishments have a total of 350 beds.

The Angalföld hospital at Budapest, for the treatment of mental and diseases, has been increased by 50 beds ; it has at present 400 beds.

The Nagykálló hospital for mental and nervous diseases has been endo 30 new beds ; it has at present 350 beds.

ms have enabled the Ministry of Social Welfare and municipalities to extend treatment considerably in the course of the year 1925. Hospitals which dequately equipped have thus been able to complete their buildings and equip- nd open new sections.

hospital treatment of patients suffering from mental diseases still meets with able obstacles owing to the economic crisis through which the country is Till within recent years, the greater part of the population was in a position after patients suffering from mental disorders at home ; at present, this is r the case, and nearly all classes of society are obliged to have recourse to . The social assistance of tuberculous patients and their treatment in hospital stitute a serious problem.

arge number of hospitals have made efforts to extend their laboratories and l posts for specialists in the laboratories and the radiological departments

nber of Doctors and Medical Students.

ngary has at present 5,962 doctors and 3,078 medical students.

ation of Sickness Insurance Institutions, 1925.

organisation of sickness insurance funds has undergone no change. The g institutions operate as sickness insurance funds :

SICKNESS INSURANCE OF INDUSTRIAL AND COMMERCIAL EMPLOYEES.

The National Workmen's Sickness Insurance Fund and its local branches ; funds, private companies affiliated to the national fund, etc. This fund ,296 members in 1923. It is the largest in the country.

The Sickness Insurance Fund : 65,883 members in 1923.

The Sickness Insurance Fund of the Francis Joseph Commercial Hospital : nembers in 1923.

The Miners' Sickness Insurance Funds : 57,457 members in 1923.

The Sickness Insurance Funds of the Tobacco Industry Employees : 8,668 s in 1923.

Sickness Insurance Funds of Hydraulic Establishments.

nough independent of the National Workmen's Sickness Insurance Fund, itutions 2 to 6 are organised on similar lines.

(b) SICKNESS INSURANCE OF STATE OFFICIALS.

majority of State officials are insured with the National Sickness Insurance State Employees. However, a certain number of them are insured with the Workmen's Sickness Insurance Fund.

change in the benefits granted to patients was made in 1925. It was decided ember who had received assistance for a whole year (the maximum duration t) could only obtain new benefits after having worked for a minimum period nths. In the case of a relapse, and if the member has not received assistance ole year, he may receive new benefits, provided he still belongs to the fund ime of his relapse.

inisterial decree enacts that, if the relapse takes place in the four weeks recovery, he may receive new benefits, whether he has worked or not during iod. The duration of benefits granted in case of a relapse must not exceed ncluding the benefits given at the time of the original illness.

BALANCE OF RECEIPTS AND EXPENDITURE OF THE NATIONAL WORKMEN'S S INSURANCE FUND.

Expenditure.

	Cro
Sick benefits	188,795
Child-bed benefits	18,338
Pregnancy benefits	6,888
Midwives' salaries	3,685
Nursing service	7,370
Medical treatment	40,643
Hospital expenses	53,775
Board in watering-places or in sanatoria	15,678
Funeral expenses	6,426
Total benefits	339,598
Total expenditure for medical treatment	51,094
Administrative costs	38,675
Reserves, etc.	55,430
Total expenditure	484,797

Receipts.

	Cro
Premiums paid up	510,940
Income from various sources	19,018
	2,568
Total receipts	532,526

4. *Mental Hygiene.*

There were 5,021 persons suffering from mental diseases under observa treatment at the beginning of the year 1925 in special establishments. The of persons admitted to these institutions in the course of the year was 5,664, 3,365 were men and 2,299 women, which brings the number of patients who treatment for mental troubles during the year to 10,685.

The incidence of mental diseases rose from 6.79 in 1924 to 7.08 per inhabitants in 1925.

After deducting deaths and persons who had been discharged from the es ments or placed in families, 5,251 persons remained at the end of the year the Hungarian asy ums. The rate of mortality among these patients was re low, not exceeding 8 to 9 per cent in the large establishments.

There are in Hungary 31 establishments for the observation and treat patients suffering from mental diseases : 3 State establishments, 4 university 1 section in a State hospital, 15 wards in municipal hospitals, a clinic for psychiatry, 2 military hospitals, 2 wards in a religious establishment, 1 hosp indigent patients and 2 private hospitals.

Mental affections were more frequent among men than among women. A the female population of Hungary exceeds the male by 400,000, the number admitted to lunatic asylums exceeded that of women by 1,066 ; 59 per cen patients admitted in the course of the year were men and 41 per cent wome rate of morbidity was 8.7 per 10,000 for men and 5.6 for women. The chie

nequality was the great number of patients suffering from dementia, paralytica
)holism. There were reported 1,052 cases of general paralysis (827 men) and
s of alcoholism (335 men). Then come dementia præcox, 1,468 cases; epilepsy,
es, and various degrees of congenital insanity, 534 cases.
number of beds available for mental cases is 5,719, or one bed per 1,398
nts.
campaign for mental hygiene in Hungary has principally aimed at solving
)lem of individual prophylaxis in mental diseases and early treatment in
. It will only be possible to carry out this plan by degrees owing to the
us financial situation.
ispensary attached to the State establishment at Lipotmezo has been established
)del of similar institutions in Paris. This dispensary gives advice to patients
from nervous and mental troubles : in less than a year, it has been attended
patients belonging to all classes of society. In many cases, the dispensary
the patient to enter an asylum and its advice was followed.
isures have been taken to organise the supervision of lunatics, alcoholics,
inded and neurotic persons in families. The placing of mental cases in families
siderably extended in 1925 at Balassajyamat, at Satoraljaujhley and at Baja.
)ber of patients thus placed has increased from 140 to 381.

VII. GENERAL QUESTIONS.

rol of Biological and Serological Products.

important change since 1924. The methods of control and supervision to
ed by the new Institute of Public Health are at present under consideration.

rol of Foodstuffs and Medicaments.

sanitary supervision of the production of and trade in foodstuffs and the
on of fraud is in the hands of the Ministry of Agriculture, which, in conjunction
Ministry of Social Welfare and Labour, is exercising a supervision which is
tended in proportion as the economic situation of the country improves.
pecial control has been established over the production of milk and its by-
s.

Ministry of Agriculture has concentrated its efforts on the control of the
on of preserved fruit, syrups and honey. Its methods of supervision are based
esults of recent research regarding vitamines.
authorities responsible for the supervision of foodstuffs realise the difficulty
ich they are confronted owing to the lack of any definition of pure food pro-
d the fact that the producers are not obliged to conform to definite standards.
ently, a " Codex Alimentarius Hungaricus " is now being compiled which will
basis of the law on food products. The department for the control of the
ion of and traffic in drugs and medicaments was very active in 1925 ; the
ce acquired by the authorities responsible for this control decided the health
ies to reorganise the sanitary control and to draw up new legislation for
police which will allow of closer supervision.

Intervention in the Housing Problem.

ing the year 1925, the Hungarian Government concentrated its efforts on
of Budapest. In 1924, four large tenement houses were begun containing

240 apartments. Six buildings with a total capacity of 150 flats were begu end of 1925. The Ministry of Social Welfare also encouraged building by loans to private persons ; these loans, which represent 60 per cent of the the buildings, are to be reimbursed in ten years ; they have been granted mo cularly to State employees and have made it possible to build approximately 5

4. *Water Supply.*

The works in connection with the water supply of the rural population standstill at present, as the communities concerned are unable to furnish t necessary for the boring of wells, which represents the most economical water supply.

On the other hand, the water supply of the towns has made satisfactory p Two towns, Salgótarján and Szent Emdre, have begun to build water conduits town of Nagykanizsa is at present enlarging its water-supply system. The c tion of aqueducts has also been undertaken by the cities of Pécs, Gyöngyös an rysébet. Artesian wells of a depth of 450 and 400 meters have been bored at K and Kunhegyes.

5. *Public Health Propaganda.*

The Ministry of Social Welfare has requested the National "Stephania ciation, the Hungarian Red Cross Society and the Hungarian Health Ass to carry out energetic public health propaganda. In response to this appea associations delivered hundreds of lectures all over the country last winter lectures were accompanied by lantern slides and films specially produced Ministry of Social Welfare to illustrate the dangers and deficiencies most fre associated with the health conditions in Hungary.

The principal doctors of the various districts have been requested to give propaganda lectures with the help of material lent by the Sanitary Reform

July 1926.

ITALY[1]

[1] ed from the report of the General Director of the Public Health Department to the Supreme Health Council d July 1st. 1924, to May 31st, 1925 (Relazione al Consiglio Superiore di Sanità intorno agli atti compiuti strazione della Sanità Publica dal 1° Luglio al 31 Maggio 1925).

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I. GENERAL INTRODUCTION.

t.

,940 square kilometers.

ulation.

16,700 inhabitants (estimate of December 31st, 1924).

h Rate, 1923.

2 per 1,000.

eral Mortality.

	Rate per 1,000	Year	Rate per 1,000
.. ..	18.15	1918	32.95[2]
.. ..	18.75	1919	18.75
.. ..	17.94	1920	18.75
.. ..	19.53[1]	1921	17.42
.. ..	19.66	1922	17.66
.. ..	19.20	1923	16.56

nl Mortality.

ear	Death rate per 1,000 persons of the same age					
	0-1 year	1-2 years	2-3 years	3-4 years	4-5 years	0-5 years
90	192.43	93.18	44.93	27.22	18.10	85.05
91	187.85	98.37	47.42	28.27	19.80	85.21
92	184.32	90.67	44.06	26.55	18.84	81.77
12	130.28	54.71	24.48	14.43	9.82	51.43
13	137.49	58.70	25.76	14.68	9.98	54.25
14	129.85	52.44	21.51	12.48	8.66	49.37
15	146.50	62.63	26.44	13.95	9.61	56.48
16	147.31	71.73	31.12	17.81	11.70	58.13
17	139.03	59.34	26.16	14.87	10.69	47.96
18	184.49	99.95	55.90	37.19	27.45	75.18
19	141.06	62.75	28.44	16.60	12.79	50.62
20	152.14	57.88	29.37	15.69	11.12	62.79
21	127.05	59.06	21.71	12.99	8.22	60.08
22	126.84	43.34	23.34	11.72	8.28	54.43
23	126.41	49.42	17.51	12.31	7.50	50.49

gel (*Financial Year* 1924-1925).

eral budget : 22.471,600,000 lire.

Budget of the Ministry of the Interior.

	Lire
inary Credits	650,582,610
f this sum .. .. have been earmarked for the Department of Public Health.	22,919,000

[1] clusive of deaths caused by the earthquake.
idemic influenza.

	Lire
Among the credits allocated to Public Health, the following headings should be mentioned :	
No. 38.—Salaries of officials of the Public Health Administration	7,030,000
No. 40.—Hospital expenses of contagious venereal cases. Upkeep of anti-venereal dispensaries ; grant to public establishments and local welfare institutes ..	7,000,000
No. 42.—Upkeep of anti-tubercular dispensaries	1,000,000
No. 43.—Grants to communes or provinces, to public welfare establishments, etc., for sending tuberculous patients to sanatoria in order to prevent the spread of the disease and for placing children exposed to contagion away from their homes	1,600,000
Grants to encourage institutions for the prevention of tuberculosis not provided for under other headings ..	600,000
No. 46.—Grant for the construction, installation, and upkeep of anti-trachoma dispensaries, etc.	600,000
No. 47.—Upkeep of laboratories of the Department of Public Health	150,000
No. 48.—Inspection of pharmacies and grants to communal pharmacies	130,000
No. 50.—Prophylactic measures in case of endemics and epidemics	1,980,000
No. 53.—Sanitary stations and port sanitary service	530,000
No. 56.—Prophylactic measures against epizootes	1,280,000
No. 59.—Anti-malaria campaign in Sardinia ..	200,000
(b) Extraordinary Credits	91,0
No. 130.—Of this sum .. .. have been earmarked for the Department of Public Health.	11,662,458

The greater part of this sum represents State grants for the payment of interest on loans contracted by the communes for public health work, in particular for laying on water-supplies.

II. INFECTIOUS DISEASES [1].

ality from Infectious Diseases [2], 1910 *to* 1923.

Deaths from infectious diseases		Year	Deaths from infectious diseases	
Total number	Rate per 1,000 inhabitants		Total number	Rate per 1,000 inhabitants
89,045	2.59	1917	93,691	2.64
96,420	2.78	1918	112,331	3.17
83,245	2.38	1919	103,189	2.86
86,063	2.43	1920	94,652	2.60
78,280	2.18	1921	80,616	2.19
88,008	2.42	1922	75,889	2.03
98,282	2.68	1923	78,717	2.08

ality from some of the Principal Infectious and Social Diseases (1912-23).

(Rate per 1,000,000 inhabitants.)

Cause of death							
Smallpox	Measles	Scarlet Fever	Typhoid Fever	Diphtheria and croup	Tuberculosis (all forms)	Malaria	Pellagra
95	208	85	221	104	1,489	91	28
4	292	156	225	98	1,493	76	29
1	178	101	194	113	1,449	57	20
1	226	51	260	117	1,576	105	22
0.4	306	73	295	119	1,664	137	22
3	90	75	263	136	1,749	237	19
26	174	44	301	135	2,090	324	18
454	78	39	212	78	1,725	187	15
303	105	45	265	87	1,598	116	9
37	117	48	274	82	1,421	131	6
1	81	68	223	72	1,399	109	5
0·4	137	62	219	73	1,425	87	4

ment of Infectious Diseases in 1924.

position in regard to infectious diseases as a whole has remained the same the preceding years. The slight recrudescence of influenza during the winter ew cases of typhoid fever which have been noted, have not been sufficiently affect the general death rate.

—

ble showing the number of cases of notifiable diseases reported in Italy in 1924 is to be found in *cal Intellig nce*, No. 9, page 140; for 1925, see *Epidemiological Intelligence*, No. 10, page 131.

heading comprises the following diseases: smallpox, measles, scarlet fever, diphtheria, croup, puerperal s, rabies, malignant pustules, tuberculosis (all forms), malaria and syphilis.

Some of the most important infectious diseases are :

(a) TYPHUS.

Three cases of typhus were notified in 1924. A thorough investigati no light on the origin of these cases.

(b) BUBONIC PLAGUE.

Three cases of bubonic plague were notified in September 1924—two and one at Portici.

On September 12th, the Prefect of Naples reported that a rat infected wi had been caught in one of the grain depots in the harbour. The depots were and improved, and the sanitary control of the working population of the was strengthened, with the result that three suspected cases of bubonic pla discovered and notified on September 15th.

Of these three patients, one died rapidly and the two others were remov isolation hospital of the commune of Naples, while their families were plac observation and their homes disinfected and cleared of rats and vermin. In cases the diagnosis was confirmed by bacteriological tests.

Investigations undertaken with a view to discovering the probable the disease revealed the following facts: (1) On August 14th, the steam *Corso*, *Piemonte* and *Ansaldo-S. Giorgio*, which had strictly conformed to the measures in force in regard to all goods originating from Buenos Ayres, had d a cargo of cereals into the depots. (2) There could no be question of the in the depots of epizootic plague. Only one plague-infected rat was di (3) No plague-infected rat was discovered elsewhere in the harbour.

Anti-plague vaccination was applied to all persons whose work exposed contagion, and the most stringent sanitary control was carried out in all throughout the province. There was no further case.

(c) MEASLES AND SCARLET FEVER.

There was an increase of measles and scarlet fever during 1924. Pro measures have little influence on the development of measles, both in con of the mild character of this disease and because it is contagious during the incubation, that is, before it can actually have been diagnosed.

During the last ten years the mortality from measles has varied betwee mum of 7.8 per 100,000 in 1919 and a maximum of 30.6 in 1916. In 1923, was 13.7 per 100,000.

There were 91,460 cases of measles notified in 1924 (75,024 in 1923). important outbreaks were in Emilia, the Abruzzi, Calabria, Lombardy, the Marches and Venetia. Sicily, the Basilicate, Latium and Sardinia provinces which suffered least.

Scarlet fever has been on the increase since 1920. The mortality from thi which was 3.9 per 100,000 in 1919, rose to 6.2 in 1923.

There were 16,000 cases of scarlet fever notified in 1924 (13,418 in 1923)

The following provinces suffered in particular : Latium (13.6 cases p inhabitants), Calabria (12.2), the Abruzzi (9.3), the Marches (7.3). Epide breaks of scarlet fever were also reported in the provinces of Venetia an

The causes of this recrudescence, from which, in point of fact, no cou escaped, are difficult to determine.

prophylactic measures in force are notoriously inadequate, however strictly
be applied, and it is to be hoped that the numerous investigations which
undertaken in Italy and in all countries will result in providing reliable
protection and cure for the population.

(d) SMALLPOX.

e were 430 cases of smallpox and varioloid notified in 1924, which represents
e compared with the preceding years. The cases observed were benign in
easily localised. Many of them, moreover, were doubtful cases.
most important incident was the outbreak in March and April 1924 in the
of Treviso and Venetia, 16 cases being notified in the former and five in the

r cases were reported in the province of Macerata, in particular, in the
of Camerino, where 17 cases of varioloid were notified between May and

he rest of Italy the cases of smallpox reported were mostly isolated and
gnant. The necessary prophylactic measures, namely, vaccination and
tion on an extensive scale, were energetically applied.
organisation on a sound basis of the vaccination services, begun in 1923, was
ontinued in 1924. The Royal Decree of December 30th, 1923, laid down
ination must be carried out in the first six months following birth, and revac-
not later than in the eighth year. The decree makes the communes respon-
expenditure on the vaccination services and for the keeping of vaccination

special service of sanitary control, which has been instituted in Sicily, Cala-
lia and the Basilicate, showed that there were certain gaps in the sanitary
of the population, especially in the smaller communes, where it was not
ice to immunise the population against smallpox. The necessary measures
into force immediately.
revision of the birth registers of the last three years has made it possible to
rge number of children vaccinated who had previously escaped.
keeping of communal vaccination and revaccination registers will enable
r of the province to ensure that no person escapes vaccination.
ist further be noted that there is now compulsory supervision of the Jenner

(e) DIPHTHERIA.

ng the five years following the war (1919-23) there have been slight fluctua-
he movement of diphtheria. The fall in the incidence of this disease was
marked than during the preceding years. This phenomenon is due as much
ed prophylactic measures (especially in schools) as to the more extensive
o-prophylaxis.
924, however, in spite of the same prophylactic measures having been con-
e number of cases notified, 15,041, represents a notable increase on the figure
eceding year. The disease especially attacked the small rural centres and,
ence, the mountain communes. We would cite the cases reported in 1924 :
, 8.2 cases notified per 10,000 inhabitants ; in Latium 7.5 ; in Tuscany, 6.7 ;
a 6.3 ; in the Marches 5.9 ; in Umbria 5. In the rest of Northern Italy, in
agna and in the Abruzzi, the morbidity rate varied between 2.8 and 3.9 ;
of Southern Italy, between 1 and 1.4 per 10,000 inhabitants.

The Department of Public Health is following with the closest attention developments in the prophylaxis of diphtheria, which is tending, on the o to adopt the Schik reaction on a large scale and, on the other hand, to use a and toxins simultaneously.

(f) EPIDEMIC CEREBRO-SPINAL MENINGITIS.

In 1924, 409 cases were notified. For the most part these were isolat of which the diagnosis was not confirmed by laboratory tests and which form a focus of infection. The slight increase which is to be noted in the of this disease, in comparison with the previous year, may be attributed to that the duty of notification has been carried out more conscientiously than h

(g) INFLUENZA.

In view of the various non-malignant forms of this complaint, it is i to determine its exact incidence from the number of notified cases. It may, be stated that the disease has lost its pandemic character and that the ca observation during the winter season were mild and seldom followed by comp

In the course of the winter of 1924, there was also a slight return of the epidemic, most marked in Northern and Central Italy.

(h) ENCEPHALITIS LETHARGICA.

There were 619 cases notified in 1924—502 in the first half-year, attainin mum of 169 in March and 138 in April. The monthly average for the sec year was about twenty cases. Cases were most frequent in Central and Italy and rare in Southern Italy and in the Islands.

The majority of notifications came from the capitals of the provinces.

The disease showed the same characteristics as those reported previ appears sporadically, with no definite relationship between cases.

(i) ACUTE ANTERIOR POLIOMYELITIS.

This disease has attracted the attention of doctors on various occasions health bureaux of the provinces have been provided with abundant not etiology, treatment and prophylaxis, drawn up by Professors Belfanti and V on the instructions of the Department of Public Health. A recent circul the nomenclature of the various names under which it is known, has remind that this disease is compulsorily notifiable.

In 1924, 250 cases were notified. As in the case of encephalitis letha focus of epidemic infection was noted and the cases reported were as a rule The majority of cases were reported in the following provinces :

Aquila	30
Reggio Emilia	29
Rome	28
Teramo	19
Bologna	16
Massa	11
Modena	10

(j) KALA-AZAR.

a-azar was made compulsorily notifiable by a ministerial decree of October 15th,
would therefore be premature to attempt to determine its incidence as yet.
test number of cases are reported from Sicily, where kala-azar takes an impor-
ce in infantile pathology. Cases also occur in Calabria.
of 2,465 children examined in 1924 at the Royal Pediatric Clinic of Catania,
ited clinical symptoms of kala-azar ; in 148 cases the diagnosis was confirmed
riological tests.
lemiological investigations in regard to this disease are being carried out.
y salts have given good results.

(k) MALTESE FEVER.

statistical data in regard to the incidence of this disease are as yet incomplete.
as only recently been classified as compulsorily notifiable.
greatest number of cases are reported in Sicily and in the southern provinces.
s endemic, with an occasional outbreak of an epidemic character. Recently,
ons of cases of Maltese fever have been received from other districts, namely,
nces of Arezzo, Massa, Turin and Florence, where the disease has been attri-
t to the presence of goats, but to the use of cow's milk or its derivatives.
ie province of Arezzo in 1923 and more markedly in 1924, there was a real
outbreak, first of all in the Cortona district, the valley of Chiana and the
of Arezzo ; later in the valley of the Arno and the Lower Casentino.
Health Laboratory at Arezzo specially investigated these cases with the
of the Department of Public Health. About 400 cases were notified in
nce of Arezzo in 1924. Research revealed the following facts : the disease
requent in rural areas and among peasants ; cities and the more populous
e practically immune ; there were no goats in the infected zone ; the disease
ially noted in farms where cows had recently calved.
Department of Public Health has encouraged research in various provinces
The work has been assigned to the institutes of clinical medicine, general
and hygiene and in certain of the universities.

(l) DYSENTERY.

lary dysentery has only occurred locally in a few unimportant cases in
, Venetia and two or three other places ; 1,062 cases were notified in 1924
1923).

(m) TYPHOID FEVER.

ality statistics and the data supplied by notifications show that this disease
ned practically stationary during recent years. The fluctuations which have
d are in general of slight importance and smaller than those observed in the
ther infectious diseases.
e same time, it is impossible to speak of phases of regression or recrudescence
to typhoid fever. The disease is endemic throughout Italy and, although
both in large centres and in small communes, it seems to be more frequent
entres which have not yet fully benefited from improvements in the soil
ing. Local circumstances and abnormal conditions may, in certain places
rtain periods, increase the spread of the disease, but, in general, it appears
emic disease associated with certain permanent conditions.

During the five years 1910-14 the average death rate from typhoid feve per 100,000 and in the following five years (1919-23) 23.8. During the 27,108 cases were notified (27,626 in 1923 ; 25,316 in 1922).

The geographical distribution of notifications is as follows :

	Death rate per 10,000 inhabitants		Dea 10,00
Latium	17.6	Piedmont	
The Marches	16.8	Campagnia	
Emilia	12.8	The Basilicate	
Umbria	9.8	Calabria	
Lombardy	9.6	Sicily	
Venetia and the Abruzzi	8.2	Apulia	
Tuscany	6.8	Sardinia	
Liguria	5.5		

Although, in comparison with the past, health conditions in Italy have improved, the death rate for typhoid fever having fallen from 800 per millio to 238, it must be admitted that the death rate is still high.

The prophylaxis of typhoid fever is therefore still one of the most health problems which Italy has to face. Numerous legislative measures taken—the construction of aqueducts and sewers, drainage works, workm lings, special measures in regard to the communal services of health and pr

Active control has been established in regard to the water-supply of the c in accordance with the circular of April 15th, 1925. The Department of Pub is endeavouring to popularise anti-typhoid vaccination, and provides the with vaccine prepared in its own laboratories. In view of the fact that t reactions which follow upon vaccination, form one of the great obstacles w the population from adopting this prophylactic method, the department is en research in vaccines administered by mouth, according to the Besredka me

(n) PUERPERAL FEVER.

Cases of puerperal infection have steadily decreased since 1887. This is due to the improvement in the technical training of midwives, to a more e and scrupulous observance of the principles of asepsis and antisepsis, and to prescribed for midwives in various regulations and circulars extending years 1890-1921.

As this disease only affects a single group of the population, its incidenc more accurately by comparing the number of deaths with the number of con than with the total number of the population.

The data furnished by the notification of cases are in complete agree those of the mortality statistics.

In 1888, 9,046 cases of puerperal infection were notified ; in 1913, 1,8 1914, 1,937. During the years of the war, notifications, and, indeed, conf too, were few in number ; 926 in 1917, 776 in 1918. From 1920 onwards th of notifications returned to the pre-war level : 1,652 in 1921, 1,551 in 192 1923 and 2,141 in 1924.

The death rate from puerperal fever—a disease which should be reg theory, as avoidable—although at present on the decrease, shows the nec more effective assistance in maternity cases.

Death Rate from Puerperal Fever, 1887-95 *and* 1912-23.

rs	Number of confinements (simple and multiple)[1]	Number of deaths from puerperal fever	Deaths from puerperal fever	
			Per 10,000 confinements	Per 1,000,000 inhabitants
annual				
e)	1,169,631	2,354	20.1	79
id.)	1,138,810	1,615	14.2	53
id.)	1,139,714	1,631	14.3	52
2	1,167,817	899	7.7	26
3	1,155,908	1,037	9.0	29
4	1,148,238	1,036	9.0	29
5	1,143,279	877	7.7	24
6	908,927	841	9.3	23
7	712,969	779	10.9	22
8	664,754	894	13.4	25
9	795,903	772	9.7	21
20	1,195,450	1,200	10.0	33
21	1,158,684	1,139	9.8	31
22	1,166,429	1,094	9.4	29
23	1,144,636	1,170	10.2	31

(o) RABIES.

1 1921 onwards, there has been a marked increase in the number of persons dogs suspected of rabies (3,958 in 1920, 5,464 in 1921 and 8,404 in 1924) s in the number of certified cases of hydrophobia, (57 in 1920 and 150 in

esponding with this increase, a recrudescence of rabies among dogs is reported provinces of Italy. The measures adopted have been a more active prophy- nst canine rabies and the more frequent use of anti-rabies vaccination. e has, moreover, been a stringent control of the work of the anti-rabies . With a view to making preventive treatment easier and having regard creased use of phenicated vaccines, which can be applied even at a distance institutes, the Department of Public Health decided to authorise the founding centres which had no anti-rabies institutes of sections for anti-rabies treat- bject to the observance of the following conditions :

1. Declaration by the director of an authorised anti-rabies institute, undertaking upon his own responsibility to supply the vaccine regularly.

2. Submission of documents certifying the technical qualifications of the director of the section.

—

figure includes still-births.

3. Certification by a technical official of the fact that the hea of the section possesses all the necessary means for preserving th and carrying out the anti-rabies treatment with all the requisite gu

In 1924, anti-rabies sections were authorised in the communes of Leghorn, Suzzara, Arezzo and Lecco.

(p) ANTHRAX.

A slight increase has also been reported in the number of cases of anthra in 1924, 2,205 in 1923, 2,029 in 1922. The most important of the pro measures come under the veterinary service and are treated in Cha paragraph 2. *(a)*.

III. SOCIAL DISEASES.

1. *Tuberculosis.*

Number of Deaths from Tuberculosis (all Forms) in Italy.

1912	.. .. ..	1,489	1918	.. ..	2
1913	.. .. ..	1,493	1919	.. ..	1
1914	.. .. ..	1,449	1920	.. ..	1
1915	.. .. ..	1,576	1921	.. ..	1
1916	.. .. ..	1,664	1922	.. ..	1
1917	.. .. ..	1,749	1923	.. ..	1

Anti-tuberculosis dispensaries are one of the most effective instrumen campaign against tuberculosis. Their number has risen from 28 before th 110 in 1922 and 168 in 1924.

Their main object is to search out cases of tuberculosis, to give mat moral assistance to sick persons and their families, and to co-operate with phila institutions, private or public, and centres of anti-tuberculosis propagand

Being convinced that it is the duty of the State to stimulate private e rather than to supersede it, the Department of Public Health takes no pa organisation of anti-tuberculosis dispensaries supported by local enterpr confines itself to granting them subsidies. During the financial period 235,000 lire were thus expended on the organisation of dispensaries, and 83 on their upkeep.

Hospitals and sanatoria are also an effective means of combating tub more especially among the poorer classes, where the only really effective prop measures that can be taken consist in removing the patient from his own hom is generally small and overcrowded.

During 1926, new sanatoria have been opened at Rome, near Milan and at I Two sanatoria for tuberculous war-invalids have been founded at Arco Ancarano, near Trieste.

Other sanatoria have increased the number of their beds. That at I for example, has instituted a new department for children with pulmonar

Italy has at the moment 8,000 beds for tuberculous patients, of which 1,400 he twelve public sanatoria :

Biraghi di Vische (Turin)	Arco (Trent)
Groppino (Bergamo)	Ancarano (Trieste)
Cuasso al Monte (Como)	Budrio (Bologna)
Prasomaso (Sondrio)	Umberto I (Leghorn)
Ornago (Milan)	" Cesare Battisti " (Rome)
Ponton (Verona)	" Cervello " (Palermo).

ce July 1917, subsidies amounting to 9,665,600 lire have been granted for and installation of hospitals and sanatoria for the treatment of tuberculosis. re are eighteen " Ospizi Permanenti ", institutions for the treatment of suffering from rickets or surgical tuberculosis. These institutions contain of about 3,900 beds.

ached to the anti-tuberculosis dispensaries are day-sanatoria for heliotherapy. n-air schools for children of school-age and schools for children suffering in tuberculosis have been founded—although in insufficient numbers—in ge towns.

re have also been founded in the towns " Preventoria ", which are intended ct children in the first and second stages of childhood, by separating them tuberculous members of their family. The best organised of these insti- ire the Institute of Puericulture, San Gregorio al Cielo ; the Maraini Institute alian Red Cross at Rome ; the " Nido-Preventorio ", Villa Paradiso, at Brescia ; mbau Asylum of the Genoese Anti-Tuberculosis Association ; the Maternal Centre at Palermo.

rt from these institutions, every province, with a few exceptions, has a central tion (" Consorzio tra i Comuni e la Provincia "), whose work it is to co- the efforts of these institutions and to direct the anti-tuberculosis campaign rovinces.

nts are made to doctors who wish to specialise in the anti-tuberculosis n, and special courses are arranged from time to time for nurses, visiting nd other health personnel in Rome, Turin, Florence, Bologna, Palermo, etc. gement is given to anti-tuberculosis propaganda. An effort is being made h magic lanterns, negatives, cinematograph films and popular pamphlets to ons and asylums which are carrying on health propaganda.

Ministry of the Interior has recently drawn the attention of Prefects to the ace of anti-tuberculosis propaganda, by organising an " Anti-Tuberculosis nda Day " (see Ministerial Circular of April 30th, 1925).

cer.

demographic and sanitary enquiry into the incidence of cancer is carried out ts of research work in certain of the most important health institutes, clinics pitals and by means of the notifications of death. The clinical formulas for purposes of international comparison have already been in use in these s for the last year and will shortly be collected by the Statistical Department, ill make an abstract of them, with the co-operation of a technical official Department of Public Health.

abstract of the special formulas No. B.3 which were distributed to all medical ners with a view to collecting fuller data in regard to deaths from cancer ose supplied in the usual notifications, has already been begun.

The Administration will thus be in possession of the results of an exten tary referendum relating to a very large number of cases observed in all the c of Italy. On the other hand, the enquiry which is being carried on in hosp throw fresh light on the regional distribution of the disease and on its various tations. Increasing use is being made of the data supplied by the den enquiry, and by comparisons it is possible at the present moment to d more accurately the relations existing between the disease, sex, age, bi mortality, occupation, etc.

The enquiry has produced one very notable result, in that it has bro the foreground the social question of cancer, which the serious problems of war period had relegated to a second place.

3. *Venereal Disease.*

The work of reorganising the services of anti-venereal prophylaxis for in the Royal Decree of March 25th, 1923, is being vigorously pursued. Th of dispensaries has risen to 139 and that of consulting centres to 164. The tration has begun to draw up statistics of the visits of sick persons in 1924 t pensaries and consulting centres, and fresh centres for the campaign against disease are being constantly created. Inspectors for this disease have been a The Department thinks of increasing health supervision by appointing new i in provinces, where the need for them is apparent. A beginning has been founding dispensaries for the free treatment of workmen and sailors of all nat in the principal ports.

4. *Trachoma.*

The campaign against trachoma is organised on the basis of the Roya No. 2292, of October 3rd, 1919, converted into Law No. 1004, of June 29 with the addition of the following paragraph : " Subsidies taken from th appropriations and from the available balance at the end of the financial y be granted to communes which have instituted or propose to institute specia for trachomatous children. "

Loans without interest have been granted for the foundation and e of anti-trachoma dispensaries, for consulting-rooms and services for the t of trachoma. Ordinary and extraordinary subsidies have been voted to e the formation of secondary centres for the prophylaxis of trachoma, to establishments for hospital treatment or for ambulatory treatment of trach persons, and to encourage propaganda and theoretical and practical cours diagnosis, treatment and prophylaxis of trachoma. The number of dis and consulting-rooms is steadily increasing. At present there are 156 dis and 28 consulting-rooms (82 dispensaries and 11 consulting-rooms in 191

The results of this campaign have been most satisfactory. In co-operat the educational authorities and in execution of the above-quoted paragrap law of June 29th, 1922, the Department of Public Health proposes to inte campaign against trachoma, especially in Sicily, Sardinia, Apulia, the Abr wherever the need is felt.

In certain provinces, particularly in Sicily, there has been instituted, in to the services for the prevention and cure of trachoma, a school service of op prophylaxis, with a view to searching out, fighting against and preventing this

aria.

DEATH RATE FROM MALARIA AND MALARIAL CACHEXIA, 1887 to 1923.

r	Number of deaths	Rate per 1,000,000 inhabitants	Year	Number of deaths	Rate per 1,000,000 inhabitants
87	21,033	710	1906	4,871	146
88	15,987	536	1907	4,231	126
89	16,194	539	1908	3,478	103
90	15,647	517	1909	3,533	104
91	18,229	599	1910	3,621	105
92	15,531	506	1911	4,420	127
93	15,301	496	1912	3,161	90
94	15,296	492	1913	2,664	75
95	16,464	526	1914	2,045	57
96	14,023	445	1915	3,835	105
97	11,947	377	1916	5,060	137
98	11,378	356	1917	8,407	237
99	10,811	336	1918	11,477	324
00	15,865	490	1919	6,760	187
01	13,558	417	1920	4,223	116
02	9,908	303	1921	4,848	131
03	8,517	259	1922	4,085	109
04	8,463	256	1923	3,307	87
05	7,845	236			

year 1924 shows a halt in the downward curve of the graph showing the e of and death rate from malaria. In a considerable part of Italy an increase ic disease was noted which is specially marked in the zones of serious endemic nd hardly perceptible in the zones of Northern and Central Italy, which are from malaria or in which it generally takes a mild form. The movement isease varied from district to district.

(b) CHARACTER OF ENDEMIC MALARIA IN 1924.

recrudescence, strictly so-called, was observed in 1924 in the provinces of and Udine, in certain parts of the province of Trieste, in the Grossetano, the Campagna and the Pontine Marshes.

Southern Italy and in the islands the number of cases was larger, but not rly serious in character, and the recrudescence was not general but localised n centres.

ly and some parts of Calabria, the Basilicate and Sardinia did not show any demic recrudescence.

characteristics of the 1924 *epidemic* were as follows :

The early occurrence of cases and pernicious forms ;
Relatively short duration of the period of dissemination, and
Large number of old cases recurring.

(c) PROBABLE CAUSES OF RECRUDESCENCE.

It has been impossible to establish the causes with any certainty. The factors, however, are worthy of mention :

1. The abundance of rain in the spring, which increased th ponds and puddles.
2. The early occurrence of summer heat, which was favo the breeding of mosquitoes during May and June.
3. Summer drought. This drought dried up many ponds, stopped for a time the endemic by abolishing conditions favourab development of new generations of mosquitoes.
4. The rapid recurrence of a great number of old cases.
5. A combination of still unknown factors—climatic co environment, preventive and curative measures being equal—whi mine every year the fluctuations in the dissemination and gravit endemic.

(d) CAMPAIGN AGAINST MALARIA.

The innovations introduced by the Royal Decree of December 30t (No. 2889), at first to some extent impaired the efficiency of the anti-malaria For example, the distribution of quinine, for which under previous laws the co had been responsible, is now entrusted to the provinces. Certain communes in districts thought that the decree in question was to come into force imm and did not therefore replenish their stocks of quinine for 1924. Once this m standing had been cleared up, the campaign against malaria was carried on cally and, during the second half of 1924, purchases of quinine were more and on a larger scale than during the corresponding period of the previo During the six months in question, the sale of State quinine preparations by 1,887 kgs. that for the second-half of 1923. Of this quantity, 1,443 k bought at special prices by communes and charitable organisations. The State quinine throughout the kingdom exceeded 20,000 kgs. in 1924.

An endeavour was made to carry out the programme drawn up by the p doctors and general inspectors of public health, which provided for strong action and intervention in the areas most affected by the recrudescence of the The sum allocated by the State for the intensification of the campaign malaria was increased in 1924 to 2,700,000 lire, to which must be added a subsidy of 300,000 lire for Sardinia. This expenditure made it possible to the relief services, to reward health officials, to assure the working of the disp sanatoria and other anti-malaria institutions and to grant subsidies to carrying on the campaign against malaria.

The Department of Public Health has devoted special attention to certain of the campaign against malaria.

The control of the trade in quinine and in various pharmaceutical remedies malaria has been made more stringent. Samples have been taken for pur analysis and defective products confiscated.

Secondary alkaloids of quinine.—The suggestion that secondary alka cinchona bark should be used in the treatment and prophylaxis of malaria consideration. Experiments carried out in the Royal Medical Clinic at Ro at the hospital of Grosseto, among the miners of Nebida and Masua in Sardin more recently, at the Hospital of the Holy Spirit at Rome, have shown t terapeutic value of cinchonine is equal to that of quinine.

question has been examined by the Health Committee of the League of Nations, decided that a comparative study should be undertaken in those places in European and American States where the endemic disease was prevalent in acute form, in regard to the therapeutic value of the following products : alkaloids of quinine bark, total secondary alkaloids and certain secondary alkaloids, particular, cinchonine. It was decided that experiments should be made in university institutes, hospitals and certain anti-malaria stations which adequate guarantees of technical control. For the supply of these substances League of Nations has applied, amongst other places, to the Italian State Quinine

Circular of November 30th, 1924.—With a view to preparing for the application of the provisions of the Decree of December 30th, 1923, the Ministry for Home Affairs sent all Prefects on November 30th, 1924, a circular prescribing the methods of buying and distributing quinine in the provinces. A second circular, dated December 26th, 1925, contained a reminder of the necessity for making purchases of quinine in good time.

Determination of the Causes of malaria.—With a view to directing the prophylaxis principally towards the destruction of mosquitoes and to considering the most effective methods for the purification of the soil, in particular as regards the so-called minor sources of malaria (the formation of small pools), it was decided to make a survey of the anopheles foci, whether in the immediate neighbourhood of houses or in the open country. This survey is now being made in the provinces of Sicily and Sardinia. It will be undertaken later on for the other provinces.

The Public Health Department will, for this purpose, be assisted by the Air Force, which will be responsible for taking photographs.

Small " bonifications ".—The work of small " bonifications " is governed by Article 5 of the new regulations for the reclaiming of swamps and marshy areas, approved by the Royal Decree of December 30th, 1923 (No. 3256). A Ministerial Circular, dated February 28th, 1925, approves the instructions issued for the carrying out of small " bonifications " and for the campaign against mosquitoes.

Campaign against malaria in the districts in process of " bonification ".—The Ministry of the Interior, the Ministry of Public Works and the Ministry of National Economy have combined their efforts to reclaim the unhealthy areas by " bonification " and by colonisation and by anti-malaria measures.

Colonisation.—The Department is concerned with the work of colonising the Libyan districts. Negotiations are at present in progress with the Ministry of National Economy with a view to taking measures to protect the health of workers and to organise their immigration to the malarial districts.

IV. PREVENTIVE MEDICINE AND HYGIENE.

Pharmaceutical Service.

(a) NEW LEGAL PROVISIONS.

The necessity for providing pharmaceutical assistance in the new quarters of the populous towns, which now constitute important communities, rendered urgent the issue of regulations in execution of Article 54 of the Royal Decree No. 2889 of December 30th, 1923, and the publication of certain provisions supplementary to

Article 66 of Regulation No. 829 of July 14th, 1924, regarding the possible of the Organic Statute of Pharmacies. The general plan of these regulat already been considered and approved by the Supreme Council of Health, th of State and the Council of Ministers. These regulations, of which the f is at present in course of preparation, are based upon past experience and an attempt to safeguard the interests of the public without prejudice to the of pharmacists and the rights guaranteed them by the legislative prov present in force.

(b) ENQUIRY INTO THE PHARMACEUTICAL SERVICE.

In view of the impossibility of increasing the already heavy financial bu the communes in general and of the smaller communes in particular, an e complex problem has to be faced in any attempt to assure pharmaceutical a to rural communes and to those quarters of the urban communes in which po is sparse and where private pharmacists find themselves in almost insupera culties, which frequently lead to their being forced to close. The Depart Health has devoted close attention to this problem. It has decreed a general with a view to ascertaining whether all the communes of Italy have a pharm service and, if such is not the case, to discover the reasons.

(c) REVISION OF THE OFFICIAL PHARMACOPŒIA.

In execution of Article 17 of the Law of May 22nd, 1913, No. 468, which for the periodic revision of the official pharmacopœia, a Ministerial Decree of D 30th, 1924, appointed a special Commission for the revision of the fourth ed the Official Pharmacopœia published in February 1920.

(d) TRADE WITH FRANCE IN PHARMACEUTICAL SPECIALITIES.

The French Law of April 19th, 1923, authorising the importation into F all Italian pharmaceutical specialities, including those which do not appea Official Pharmacopœia, granted Italy the reciprocity of treatment laid dow Special Convention of 1907.

As the application of the French and Italian Customs tariffs relating to ceutical specialities had given rise to certain complaints by producers in countries, the French Government proposed a special agreement after an under has been come to between the producers of both countries. A meeting of r tatives of these countries will take place shortly in Paris.

2. *Veterinary Hygiene.*

(a) MEASURES AGAINST ANTHRAX.

The policy of the Ministry has been to apply energetically the general and measures for veterinary supervision at present in force against anthrax i (cremation or destruction of carcases of animals infected with anthrax carrying out of compulsory disinfecting measures), and to encourage the pra vaccination and sero-vaccination.

Considerable sums have been advanced of late to the Prefects of the p of Southern Italy, especially Sardinia and Sicily, which are the most affected epizootic disease, with a view to placing them in a position to carry out mea immunisation on a larger scale.

number of vaccinations and sero-vaccinations carried out during the past
l period reached a high figure and marks a continuation of progress as compared
e previous financial period.

mber of Animals Vaccinated between 1921 *and* 1924 *in Certain Provinces.*

Provinces	Financial period 1921-22	Financial period 1922-23	Financial period 1923-24
	Number of head of cattle treated	Number of head of cattle treated	Number of head of cattle treated
.. ..	80,000	350,000	700,000
.. ..	51,000	150,000	600,000
.. ..	46,903	51,708	73,996
setta	15,757	39,169	91,035
.. ..	28,333	40,681	62,071
.. ..	221,993	631,558	1,527,102

ie other provinces of Italy are also taken into account, the number of animals is certainly over 2,000,000. The practice of immunisation against anthrax iderably reduced the number of cases.

breaks caused by the water used in tanneries and especially in works which ns from overseas countries, deserve special mention. The virulence of the s in some instances greater than the resistance conferred by normal vaccina- me experts have recommended stronger immunisation by means of a third on. This treatment necessitates greater precautions than the normal treat- it it is certainly more efficacious. Vaccination has not always given the results in cases in which infection has been due to tanneries, and the ideal would undoubtedly be to prevent the water used in tanneries from being l for purposes of irrigation or for cattle. The administrative authorities iring into this aspect of the question and are endeavouring to facilitate a in spite of the economic and other obstacles which only too frequently prove isuperable.

(b) MEASURES AGAINST RABIES.

period following immediately upon the war showed a considerable recrudes- rabies throughout Europe. The Ministry immediately took the requisite of defence and drew the attention of Prefects to the necessity of seeing veterinary police regulations in regard to the prophylaxis of rabies were ut, recommending them especially to take stronger measures to catch stray

ects were authorised for this purpose to use funds placed at their disposal ampaign against epizootic diseases. The results were satisfactory, and in iere the capture of stray dogs was carried out systematically there was an e decrease in the number of cases of rabies.

Ministry also followed the practice of foreign countries, especially of Japan, rophylaxis of canine rabies ; it encouraged experiments in the anti-rabies on of dogs on an extensive scale.

The weekly reports of the Veterinary Service show that the number of canine rabies is decreasing slowly but surely. The monthly average of cases during the last six months of 1924 was 55 as compared with 70 dur previous half-year.

Rabies is, nevertheless, more frequent than before the war, and in spite of o raised by certain persons inspired with a misplaced love of animals, the ca continues and should continue with the assistance of all the competent aut

3. *Control of Foodstuffs.*

(a) MEAT.

The import of animal products, which has considerably increased during years, whether for purposes of food or for industrial purposes, has been place strict sanitary control both on the land and sea frontiers. Under Article 3 Veterinary Police Regulations of May 10th, 1914, special provisions were to down in regard to these imports, exclusive of those which come under inter conventions. These provisions are embodied in the Ministerial Decree of Janu 1923, which cancels that of October 1st, 1914. This decree distinguishes animal products destined for food and those destined for industrial purpose former are subject to certain conditions in regard to their preparation. M its derivatives must be accompanied by a certificate of origin, certifying that from healthy animals.

All foodstuffs are subject to sanitary inspection on arrival at the Italian Import licences are not granted unless the results of such inspection, supple if necessary, by laboratory research, prove satisfactory. The Decree of Ap 1924, lays down special conditions for the import of frozen meat with th removed.

The importation of the meat of horses, dogs and cats, whether fresh or p is prohibited.

Pork, whether fresh or prepared, originating from countries where tri is prevalent, may not be imported unless accompanied by a certificate of origin ing that it has been submitted to microscopic examination and has been sho free from trichinæ.

Mention must also be made of the Decree of January 1st, 1923, in accorda which tins containing meat, extracts of meat, fish, whether salted or preserve must be hermetically sealed and bear in clear and indelible characters a st of contents, the name of the manufacturing firm and its trade mark.

The importation of the meat of ruminants originating from countries i cattle-plague is prevalent, is prohibited, exclusive of tinned meats. The imp of frozen or refrigerated meat from Erythria is permitted under certain co

A certificate of origin and cleanliness is not necessary for animal prod industrial purposes, if produced under satisfactory conditions of preservat preparation. On the other hand, fresh hides, raw wool, offal and fresh blood accompanied by the usual certificate, stating that the country of origin is f cattle-plague.

(b) SPECIAL PROVISIONS REGARDING FROZEN MEAT.

The consumption of frozen meat, which is steadily increasing in Italy, h it necessary to strengthen sanitary supervision from the time of its discharge i ports until it reaches the hands of the retail trader. Experiments are now being

ascertain whether the cold storage organisation and the climatic conditions will permit the importation not only of frozen meat but also of frozen offal, would considerably relieve the present food crisis.

special duties in regard to certain frozen meat make a heavy call on the ry service, which, although it is able to cope with the situation, will have to ased in proportion to the growing needs of the country.

(c) MILK.

its meeting on June 30th, 1924, the Supreme Council of Public Health passed owing recommendation : " The Council expresses the hope that the recent ions in the organisation of the sanitary services will result in a more stringent of foodstuffs, and it recommends that the Department of Public Health and make known the methods to be adopted in the analysis of foodstuffs verages. "

ile waiting until the increase of its staff will enable it to carry out this recom- on effectively, the Administration of Public Health has begun to consider e programme for the revision and standardisation of the methods of analysing ffs and beverages. In the meantime the Ministry has decided to begin by ening the sanitary control of milk.

ere are two distinct phases in the control of milk : (1) The production, pro- -called, in the stalls of milk-giving animals, where milking is generally done: transport of milk from the stall to the places where it is deposited, preserved, up or sold to the public.

General Sanitary Regulations of February 3rd, 1901, No. 45, lay down that munal sanitary authority shall be responsible for the frequent inspection of necessary, scientific research into the health condition of animals giving milk. proposal of the sanitary official, the mayor may order the isolation of sick and prohibit the use of their milk for purposes of food. This measure will n whenever cases of infectious disease have been notified either in animals ns (Article 113).

enever a case of tuberculosis is reported on a dairy farm, the sick animal is to ted, the stable disinfected and no animal to be admitted until it has been ed to a tuberculin test which has given a negative reaction (Article 162). enever a case of tuberculosis has been reported at a dairy farm (either among or among the animals), the milk can only be sold after it has been boiled under rvision of the sanitary authorities, such measures to continue until the infected or animal is isolated (Article 163).

icle 114 and paragraph 2 of Article 107 prohibit the sale, storage or distribu- wages (for the purpose of feeding employees) of the following milks :

ostrum, milk of animals suffering from an affection of the udder, from foot- uth disease, tuberculosis, smallpox, anthrax, pleuro-pneumonia, septicæmia, aundice or dysentery ; the milk of animals fed upon forage which is poisonous, d or capable of communicating a noxious odour or taste to the milk ; milk with toxic substances ; blue, red, bitter, viscous, putrid milk or milk with an al colour, smell or taste ; milk showing obvious signs of dung or of any con- ed acid milk or milk which coagulates in contact with carbonic acid or upon ; milk to which has been added any foreign substance with a view to preser- or to correcting certain defects (in exceptional cases condensed milk may have dded) ; milk to which water has been added or which has been adulterated way.

All milk is considered to have had water added when it contains a qua
fat and of residue inferior to the minimum prescribed in the local health regu

The special regulations regarding sanitary control of August 3rd, 1890, N
Articles 74 to 88, contain clear and precise provisions as to the conditions unde
authorisation may be granted for the opening of dairy farms or milk shops, re
the sanitary conditions in cowstalls, the notification of cases of disease among
or staff and the feeding and milking of animals. The veterinary authori
responsible for carrying out these provisions.

As regards the second phase of the sanitary control of milk, that is to
transport to places of deposit or sale, Article 125 of the General Sanitary Reg
as amended by the Royal Decree of June 23rd, 1924, No. 369, specifies the sub
which may not be added to foodstuffs and beverages for the purpose of e
preservation. Receptacles for milk must be well covered and always kept in
of cleanliness. They must be frequently disinfected with boiling solutions of
soda, lime or any other substance specified by the sanitary authorities. Rec
for conveying the milk from the stall to the depot or place of sale must bear
clearly indicating the name of the proprietor and the origin of the milk.

Article 107 of the General Sanitary Regulations strictly prohibits the sale,
for purposes of sale, or use in payment of wages (employees whose meals are p
by their employers) of milk or derivatives of milk originating from animals
by any disease specified in Article 114, together with foodstuffs or beverages t
have been added foreign substances or colouring matter for the purpose of in
or increasing the natural colour. This prohibition applies equally to all foo
which, in consequence of their composition or abnormal method of preparatio
be detrimental to the health of the consumer or which show signs of decomp
even if little advanced.

Under Article 108, foodstuffs and beverages of which the natural composit
quality do not correspond to the name under which they are sold to, or asked
the public, shall be considered as adulterated, even if it be proved that they
harmful.

The following are also considered as adulterated :

Foodstuffs and beverages when partly deprived of their nutritive el
mixed with products of an inferior quality, or treated in such a way as to alt
natural composition.

The sale of foodstuffs and beverages thus adulterated is, however, per
when accompanied by a clear statement of the process to which they hav
subjected.

The last paragraph of Article 114 of the General Sanitary Regulations lay
the criteria necessary for deciding whether the milk should be considered as
or adulterated.

Under Article 95, only pure milk, skimmed milk or milk passed through a
fugal machine can be offered for sale. The receptacle must bear a label s
to which of the three categories the milk belongs.

Articles 97, 98 and 99 lay down rules in regard to the taking of samples

The development of the milk industry in recent years has made it ne
to issue provisions supplementary to those which we have just recapitulated

Article 61 of the Royal Decree of December 30th, 1923, marks the first
this direction.

Under the terms of this article milk to which has been added condense
containing less than 3 per cent of fatty substances is deemed to be adulterate

sanitary inspection of milk, which at the present time undergoes so many
s of manipulation, should always aim at guaranteeing, first, that the milk
om healthy animals and, secondly, that the processes which it undergoes
xpose it to any contamination or deterioration. It should aim at stimulating
duction of wholesome and pure milk and at suppressing all attempts at
tion.
Ministry is endeavouring to supplement the sanitary provisions already in
l to make their application stricter.

lic Work for Health Purposes.

sanitary improvement work, inaugurated in Italy by the Law of July 14th,
. 4791), instituting loans on favourable terms for sanitary undertakings, is
ng from day to day. Public opinion is demanding, more strongly than ever
n intensified prosecution of this campaign for sanitary improvement, in which
its hopes for the regeneration of the country.

ns.—During the second half of 1924, the State granted loans on favourable
r a total sum of 52 million lire, 47,600,000 being subject to no interest and
inder to interest at 2 per cent. For other branches of public health work it
l loans amounting to 22 million lire, 11,620,000 at the rate of 1½ per cent
tion of sewers in Apulia) and the remainder at 2 per cent.

sidies.—Large subsidies were granted, in particular for the supply of drinking
communes suffering from drought and for urgent prophylactic measures
nfectious diseases.

stance for the Communes of Southern Italy.—Most of the grants-in-aid during
year were devoted to communes in the south, *viz.*, about 34,500,000 lire out
ans, for the construction of conduit-pipes, and 18,610,000 out of the sums
or other public health work (inclusive of the loans for the construction of
Apulia). Out of the 74 million lire allocated for loan purposes during the
question, 53,110,000 lire were granted to the southern communes.

linia.—The Royal Decree of November 6th, 1924 (No. 1931), granted Sar-
sum of one milliard lire for public works. The greater part of this work
ic health work. The Department of Public Health devoted special attention
eeds of Sardinia—construction of water-conduits, sewers and cemeteries ;
ctic measures against malaria, tuberculosis, typhus, trachoma, anthrax and
urges.
Royal Decree of March 19th, 1925 (No. 266), sanctioning the allocation of
rd lire for public works, also approved the allocation of one milliard lire to

LATVIA

BY

Dr. Ernest FEHRMANN

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I. GENERAL INTRODUCTION.

91 square kilometers.

lation.

4,805 inhabitants.
racial distribution of the population was shown in the *International Health* *k* for 1924.
re are in Latvia 38 towns, 31 of which have more than 2,000 inhabitants, 32.8 per cent of the total population of the country. The population of the hich in 1914 amounted to 40.3 per cent of the total population, in 1920 l to only 23.5 per cent.

(a) DISTRIBUTION OF POPULATION ACCORDING TO SEX.

re is a considerable preponderance of the female sex :

In 1897	1,039	women to	1,000 men
In 1920	1,211	,, ,,	,,
In 1925	1,145	,, ,,	,,

excess of women, although less than in 1920, is still higher than in any other with the exception of Russia.

(b) DISTRIBUTION OF POPULATION ACCORDING TO RELIGION.

	Per cent
Lutherans	57.20
Catholics	22.59
Orthodox	9.08
Jews	5.19
Old Believers	4.84
Protestants of various persuasions	0.84
Unclassified	0.26

(c) DISTRIBUTION OF POPULATION BY AGE-GROUPS.

ormally constituted population may be represented by a pyramid formed of placed one above the other representing the various age-groups and having ase the stroke which represents the youngest age-group. The figures of the aken in 1897 on the present Latvian territory shows a pyramid of almost ymmetry, the base of which formed by the age-group from 0-4 years represents cent of the total population of the country. For 1920 this age-group only ted 6.4 per cent of the total population ; in 1925 it had arisen to 8.7 per cent. nomenon shows perhaps better than any other indication that life in Latvia ing its normal course.

Distribution of the Population into Three Age-Groups : Childhood, Working Age, Old Age, 1920-25.

Age	Men		Women		T
	1920	1925	1920	1925	1920
	Per cent		Per cent		Per
0 to 15 years (childhood) ..	31.25	26.36	25.49	22.83	28.09
15 to 60 years (working age) ..	56.37	62.57	61.07	64.37	58.95
60 years and over (old age) ..	12.38	11.07	13.44	12.80	12.96

As among all the nations which took part in the world war the worki group (15-60 years) has considerably increased since 1920, this sudden increase exceeds 6 per cent for men, is the result of the entrance into this group of a re high number of individuals born after 1900 and spared by the war because age. The childhood group (0-15), on the other hand, has diminished prob a consequence of unemployment, which will no doubt tend to disappear in t ten years and the effects of which will be mitigated by the fact that the pro between individuals of productive age and the amount of work available will favourable.

(d) DISTRIBUTION OF POPULATION ACCORDING TO THE CIVIL REGISTE IN 1925.

	Men		Women	
	1920	1925	1920	1925
	Per cent		Per cent	
Bachelors	57.61	56.24	52.89	50.59
Married men and women	38.46	40.33	33.54	35.96
Widowers and widows ..	3.73	3.14	13.32	13.03
Divorced men and women	0.20	0.29	0.25	0.42
	100	100	100	100

3. *Birth and Death Rates* (total figures and rate per 1,000 inhabitants).

(a) GEOGRAPHICAL DISTRIBUTION.

Provinces	Live Births				Deaths				Excess o
	1924		1925		1924		1925		
	Absolute figures	Rate per 1,000	Absolute figures	Rate per 1,000	Absolute figures	Rate per 1,000	Absolute figures	Rate per 1,000	1924
Riga.	5,278	15.63	5,356	15.74	4,555	13.49	4,562	13.42	2.14
Livonia. ..	6,494	16.04	6,650	16.40	5,753	14.21	5,619	13.86	1.83
Courland ..	5,825	20.32	5,699	19.83	4,470	15.59	3,832	13.32	4.73
Zemgale ..	5,778	20.94	5,956	21.51	4,249	15.40	4,033	14.56	5.54
Latgale ..	17,797	32.98	17,653	32.47	9,372	17.37	9,637	17.72	15.61
Latvia.. ..	41,172	22.32	41,314	22.31	28,399	15.39	27,683	14.95	6.93

(b) SEASONAL DISTRIBUTION.

Months	Live Births				Deaths			
	1924		1925		1924		1925	
	Absolute figures	Percentage of births for the year	Absolute figures	Percentage of births for the year	Absolute figures	Percentage of deaths for the year	Absolute figures	Percentage of deaths for the year
.. ..	4,065	9.9	3,852	9.3	2,877	10.1	2,410	8.7
.. ..	3,533	8.6	3,340	8.1	2,653	9.3	2,505	9.1
.. ..	3,966	9.6	3,572	8.7	2,945	10.4	2,772	10.0
.. ..	3,656	8.9	3,438	8.3	2,557	9.0	2,558	9.2
.. ..	3,524	8.6	3,320	8.0	2,531	8.9	2,431	8.8
.. ..	3,261	7.9	3,248	7.9	2,108	7.4	2,184	7.9
.. ..	3,243	7.9	3,438	8.3	2,036	7.2	2,096	7.6
.. ..	3,087	7.5	3,419	8.3	2,216	7.8	2,076	7.5
er..	3,226	7.7	3,358	8.1	1,949	6.9	1,851	6.7
.. ..	3,048	7.4	3,384	8.2	2,104	7.4	2,102	7.6
er..	3,384	8.2	3,565	8.6	2,138	7.5	2,155	7.8
r	3,179	7.7	3,380	8.2	2,285	8.1	2,543	9.1
al	41,172	100	41,314	100	28,399	100	27,683	100

(c) DISTRIBUTION OF MORTALITY BY AGE-GROUPS.

Age-Groups	Deaths in 1924		Deaths in 1925	
	Absolute number	Rate per 1,000 persons of the same group	Absolute number	Rate per 1,000 persons of the same group
1 year..	4,152	110.2	4,430	117.6
4 years	2,183	17.7	2,321	18.8
9 years	473	4.2	466	4.1
14 years	459	2.7	513	3.0
19 years	686	3.8	684	3.8
24 years	974	5.7	984	5.7
29 years	781	5.6	834	6.0
34 years	772	6.2	730	5.8
39 years	766	6.3	716	5.9
44 years	906	7.7	819	6.9
49 years	1,042	9.2	1,039	9.2
54 years	1,449	13.4	1,359	12.6
59 years	1,585	18.7	1,462	17.2
64 years	2,110	25.7	2,057	25.1
69 years	2,065	37.9	1,969	36.2
74 years	2,414	59.2	2,208	54.5
79 years	1,940	88.3	1,919	87.3
84 years	1,709		1,503	
89 years	928	156.8	862	143.9
94 years	436		393	
00 years	178	239.3	139	207.3
over	120	452.8	99	373.6
nown	271	14.2	177	9.3
.. ..	28,399	15.39	27,683	14.95

(d) DISTRIBUTION OF MORTALITY IN RIGA ACCORDING TO THE PRINCI CAUSES OF DEATH (1923) [1].

Causes of Death	192 Number of deaths
1. Tuberculosis	633
2. Diseases of the circulatory system	635
3. Acute infectious diseases and septicæmia	301
4. Diseases of the respiratory organs	342
5. Cancer and other malignant tumours	454
6. Diseases of the nervous system	381
7. Diseases of conformation	395
8. Diseases of the digestive and genito-urinary organs	323
9. Violent deaths	145
10. Suicide	95
11. Other causes of death and unknown causes	164
Total	3,868

[1] These data are only available for the city of Riga.

(e) DISTRIBUTION OF LIVE BIRTHS ACCORDING TO LEGITIMACY AND CRE IN 1924 AND 1925.

Creed	Live births 1924		Illegitimate births per 100 births	Live births 1925	
	Legitimate	Illegitimate		Legitimate	Illegitimate
Lutheran	16,693	1,328	7.37	16,760	1,435
Catholic	12,118	609	4.79	12,310	622
Greek Orthodox	4,419	282	6.00	4,313	277
Old Believers	3,320	314	8.64	3,216	323
Jews	1,804	36	1.96	1,713	41
Other denominations and unknown	207	42	16.87	208	56
Total	38,561	2,611	6.34	38,520	2,794

) GEOGRAPHICAL DISTRIBUTION OF STILL-BIRTHS IN 1924 AND 1925.

Districts	Number of births	Still-births	Still-birth rate	Number of births	Still-births	Still-birth rate
	1924			1925		
iga.	5,422	144	2.66	5,523	167	3.02
.. ..	6,593	99	1.50	6,755	105	1.56
.. ..	5,937	112	1.89	5,813	114	1.96
.. ..	5,579	89	1.60	5,816	69	1.19
.. ..	6,894	29	0.42	7,637	28	0.37
.. ..	30,425	473	1.55	31,544	483	1.53

?.—This table shows only the 30,425 births registered in the offices of the gistry in 1924 and the 31,544 registered in 1925. According to the data of istical Office of the State, the number of live births amounted to 41,172 in l 41,314 in 1925. This difference is due to the fact that the Catholic clergy ses to supply the data required by the Civil Registrars.

nt Mortality.

(a) NUMBER OF DEATHS AND RATE PER 1,000 BIRTHS 1924-25.

	Number of deaths	Rate per 1,000 births
1924	4,152	100.8
1925	4,430	107.2

(b) DISTRIBUTION BY AGE-GROUPS.

1924	Number of deaths	Rate per 1,000 births	Percentage of mortality
1 month	1,185	28.8	28.5
2 months	847	20.6	20.4
11 months	2,120	51.5	51.1
Total	4,152	100.8	100.0

1925	Number of deaths	Rate per 1,000 births	Percentage of mortality
1 month	1,249	30.2	28.2
2 months	889	21.5	20.1
11 months	2,292	55.5	51.7
Total	4,430	107.2	100.0

(c) SEASONAL DISTRIBUTION 1924-25.

Month	Deaths in 1924		Deaths in 1925	
	Absolute figure	Rate per 100	Absolute figure	Rate
January	330	7.9	372	
February	305	7.3	424	
March	356	8.6	471	
April	311	7.5	366	
May	320	7.7	340	
June	310	7.5	351	
July	335	8.1	460	
August	518	12.5	444	
September	416	10.0	326	
October	358	8.6	272	
November	297	7.2	281	
December	296	7.1	322	
	4,152	100.0	4,430	

(d) DISTRIBUTION OF INFANT MORTALITY ACCORDING TO LEGITIMACY IN 1922-25.

Year	Legitimate			Illegitimate			Total	
	Live births	Number of deaths	Rate per 1,000 births	Live births	Infant mortality		Live births	Infant m
					Number of deaths	Rate per 1,000 births		Number of deaths
1922	4,294	321	74.76	464	99	213.36	4,758	420
1923	4,463	291	65.20	544	134	246.32	5,007	425
1924	4,635	368	79.40	643	200	311.04	5,278	568
1925	4,655	350	75.19	701	150	213.98	5,356	500

ANT MORTALITY IN RIGA BY AGE-GROUPS AND ACCORDING TO LEGITIMACY
1922-25.

	1922						1923					
	Legitimate children		Illegitimate children		Total		Legitimate children		Illegitimate children		Total	
	Number of deaths	Rate per cent	Number of deaths	Rate per cent	Number of deaths	Rate per cent	Number of deaths	Rate per cent	Number of deaths	Rate per cent	Number of deaths	Rate per cent
..	66	20.6	32	32.3	98	23.4	76	26.1	32	23.8	108	25.4
..	18	5.6	4	4.1	22	5.2	25	8.3	10	7.5	34	8.0
month	25	7.8	3	3.0	28	6.7	21	7.2	11	8.2	32	7.5
..	39	12.2	17	17.1	56	13.4	19	6.5	13	9.7	32	7.5
..	28	8.7	14	14.2	42	10.0	22	7.2	14	10.4	35	8.2
..	22	6.8	3	3.0	25	5.9	16	5.5	19	14.2	35	8.2
..	19	5.9	9	9.1	28	6.7	18	6.2	10	7.5	28	6.6
..	21	6.5	4	4.1	25	5.9	25	8.6	6	4.5	31	7.3
..	8	2.5	2	2.0	10	2.4	14	4.8	6	4.5	20	4.7
..	20	6.2	4	4.1	24	5.7	6	2.1	7	5.2	13	3.1
..	15	4.7	2	2.0	17	4.0	18	6.2	2	1.5	20	4.7
..	15	4.7	2	2.0	17	4.0	10	3.4	2	1.5	12	2.9
..	14	4.4	1	1.0	15	3.6	9	3.1	1	0.75	10	2.4
..	11	3.4	2	2.0	13	3.1	14	4.8	1	0.75	15	3.5
..	321	100.0	99	100.0	420	100.0	291	100.0	134	100.0	425	100.0

	1924						1925					
	Legitimate children		Illegitimate children		Total		Legitimate children		Illegitimate children		Total	
	Number of deaths	Rate per cent	Number of deaths	Rate per cent	Number of deaths	Rate per cent	Number of deaths	Rate per cent	Number of deaths	Rate per cent	Number of deaths	Rate per cent
..	82	22.3	29	14.5	111	19.5	94	26.9	29	19.3	123	24.6
..	18	4.9	6	3.0	24	4.2	23	6.6	3	2.0	26	5.6
month	23	6.3	11	5.5	34	6.0	25	7.1	12	8.0	37	7.4
..	30	8.2	22	11.0	52	9.2	31	8.9	16	10.7	47	9.4
..	27	7.3	30	15.0	57	10.0	23	6.6	15	10.0	38	7.6
..	25	6.8	25	12.5	50	8.8	21	6.0	9	6.0	30	6.0
..	21	5.7	10	5.0	31	5.5	15	4.3	16	10.7	31	6.2
..	16	4.3	12	6.0	28	4.9	26	7.4	5	3.3	31	6.2
..	29	7.9	15	7.5	44	7.8	18	5.1	11	7.3	29	5.8
..	24	6.5	13	6.5	37	6.5	15	4.3	13	8.7	28	5.6
..	18	4.9	7	3.5	25	4.4	16	4.6	7	4.7	23	4.6
..	17	4.6	8	4.0	25	4.4	13	3.7	5	3.3	18	3.6
..	18	4.9	6	3.0	24	4.2	13	3.7	5	3.3	18	3.6
..	20	5.4	6	3.0	26	4.6	17	4.8	4	2.7	21	4.2
..	368	100.0	200	100.0	568	100.0	350	100.0	150	100.0	500	100.0

(f) SEASONAL DISTRIBUTION OF INFANT MORTALITY IN RIGA 1922-2

	Infant Mortality						
	1922		1925		1924		19
	Number of deaths	Rate per cent	Number of deaths	Rate per cent	Number of deaths	Rate per cent	Number of deaths
January	35	8.4	36	8.5	48	8.5	44
February	39	9.3	30	7.2	54	9.5	43
March	39	9.3	43	10.1	35	6.2	47
April	46	10.9	42	9.9	47	8.3	38
May	37	8.8	34	8.0	38	6.6	46
June	32	7.5	25	5.9	52	9.1	41
July	38	9.1	36	8.5	69	12.1	47
August	38	9.1	41	9.6	64	11.3	48
September	36	8.6	31	7.2	27	4.7	32
October	26	6.2	42	9.9	48	8.5	35
November	24	5.7	33	7.8	47	8.3	36
December	30	7.1	32	7.5	39	6.9	43
Total	429	100.0	425	100.0	568	100.0	500

(g) DISTRIBUTION OF INFANT MORTALITY IN RIGA ACCORDING TO LEGITIM
THE PRINCIPAL CAUSES OF DEATH 1922-25.

Causes of Death	Infant Mortality						
	Legitimate children	Illegitimate children	Total	Rate per cent	Legitimate children	Illegitimate children	To
	1922				1923		
1. Debility and congenital deformities	73	26	99	23.6	84	40	1
2. Diseases of the respiratory organs	60	15	75	17.9	50	25	
3. Diarrhœa and enteritis	39	14	53	12.6	39	16	
4. Diseases of the nervous system	21	4	25	6.0	22	5	
5. Meningitis (except tubercular meningitis)	16	2	18	4.3	21	2	
6. Tuberculosis	14	2	16	3.8	17	8	
7. Acute epidemic diseases, including congenital syphilis and septicæmia	28	7	35	8.3	12	8	
8. Other diseases	13	4	17	4.0	11	6	
9. Violent death and starvation	3	13	16	3.8	3	11	
10. Unknown or unascertained causes	54	12	66	15.7	32	13	
Total	321	99	420	100.0	291	134	4

STRIBUTION OF INFANT MORTALITY IN RIGA ACCORDING TO LEGITIMACY AND THE PRINCIPAL CAUSES OF DEATH 1922-25 *(continued)*.

Causes of Death	Infant Mortality							
	Legitimate children	Illegitimate children	Total	Rate per cent	Legitimate children	Illegitimate children	Total	Rate per cent
	1924				1925			
lity and congenital deformities			143	25.2			113	22.6
ases of the respiratory organs			113	19.9			72	14.4
rhœa and enteritis			92	16.2			79	15.8
ases of the nervous system			30	5.3			42	8.4
ngitis (except tubercular menin-is)			27	4.7			25	5.0
rculosis			35	6.2			24	4.8
e epidemic diseases, including								
ngenital syphilis and septicæmia			66	11.6			66	13.2
r diseases			21	3.7			36	7.2
nt death and starvation			8	1.4			4	0.8
nown or unascertained causes			33	5.8			39	7.8
Total			568	100.0			500	100.0

get.

	Lats[1]
eral Budget for the fiscal year 1925-26	160,949,256
get of the Ministry of Social Welfare	9,464,798
erinary service	298,511
ical service of State railways	437,834
ncipal items in Health Budget :	
Salaries, upkeep of offices and laboratories, etc.	484,754
Repairs to buildings and new constructions	6,574
Upkeep of State hospitals and repairs to hospitals	1,520,332
Upkeep of quarantine station of Liépaja (Libau)	11,517
Campaign against rabies	2,500
Campaign against venereal diseases	1,000
Campaign against infectious diseases	5,000
Subsidy to the Anti-Tuberculosis Society	4,000
Subsidy to the Association for Mother and Child Welfare	7,000
Pensions to disabled soldiers and their families	2,466,000
Pensions of officials and army pensions, etc.	76,000
Subsidies to the sick benefit clubs (2 per cent of salary)	2,745,600
Medical attendance of State officials	556,600
Upkeep of infants and children's homes	389,340
Institutions for the blind	102,479
Installation of sanatorium for tuberculous officials	200,000

[1] 1 lat equals one Swiss franc.

II. RECENT REFORMS IN HEALTH ADMINISTRATION AND LEGISLA

1. *Organisation of the Public Health Service (see* graph on the following page)

2. *Principal Laws and Regulations enacted in* 1925.

Instructions regarding compulsory vaccination against smallpox (January
Regulation regarding the installation and service of private clinics (January
Sanitary regulations regarding the cleaning of streets and open spaces in th district (June 23rd).

Instructions concerning the export of cattle abroad (January 5th).

Instructions for the application of the law for the campaign against alco (April 20th).

Regulations concerning the declaration of infectious diseases (August 3rd

Law regarding the amalgamation of the Department of Public Health w Ministry of Social Welfare (August 8th).

Decree regarding the campaign against foot-and-mouth disease.

Decree regarding the duties of the police in the campaign against foot-and- disease and the declaration of cases of this disease (November 7th).

Prohibition of importation of horses, of large and small cattle and of pro from Lithuania on account of foot-and-mouth disease (November 7th).

Ratification of the Health Convention concluded on July 7th, 1922, between and Poland (May 5th).

Entry into force of the Protocol regarding veterinary traffic between L and Czechoslovakia (June 25th).

III. EPIDEMIC AND CONTAGIOUS DISEASES [1].

Typhus fever : 96 cases reported. As in the previous year, the majority o cases were noted near the Russian and Lithuanian frontiers and at Riga. In 290 cases.

Relapsing fever : 997 cases reported (405 at Riga). In 1924 : 1,547 cases (Riga).

Dysentery : 150 cases. In 1924 : 276 cases.

Diphtheria : 665 cases. In 1924 : 594 cases.

Whooping-cough : 919 cases. In 1924, 495 cases.

Scarlet fever : 2,767 cases reported. In 1924 : 1,450 cases.

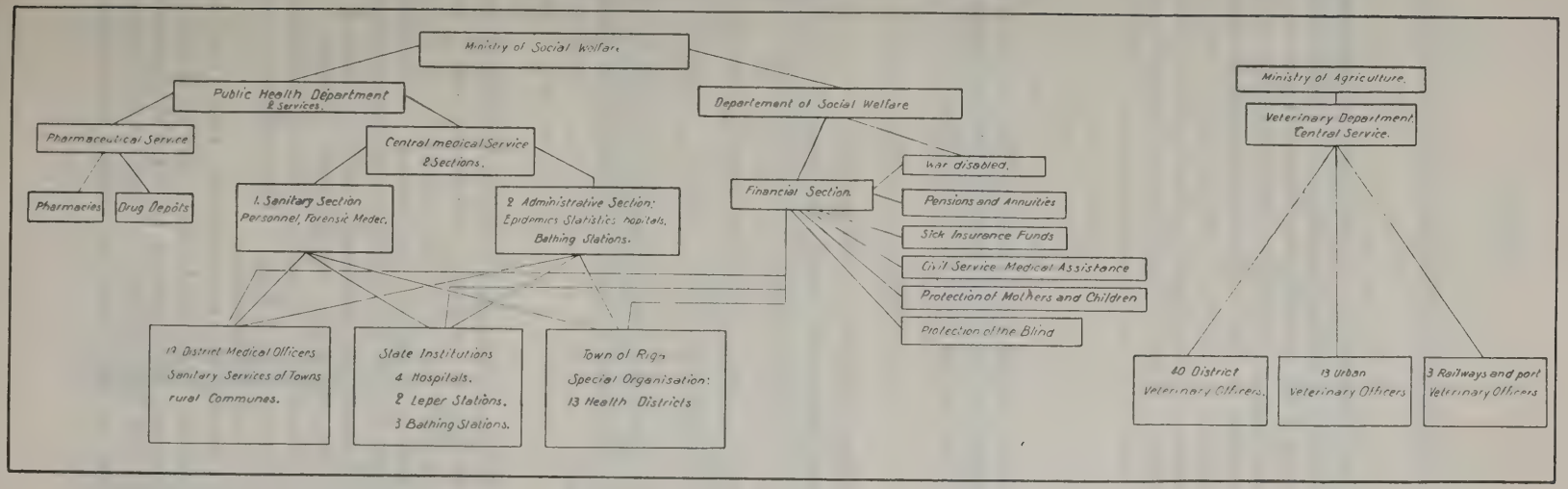
Smallpox.—Thanks to compulsory vaccination, which is very strictly enf only 17 cases of smallpox have been observed, the majority in Latgale, in di close to the Russian frontier.

Rabies shows no decrease. Three hundred and seventy persons suffering suspected bites underwent anti-rabies treatment at the Pasteur Institute at Rig

---

[1] A table showing the number of cases of notifiable diseases reported in Latvia in 1925 is to be *Epidemiological Intelligence*, No. 10, page 132.

Public Health Organisation of Latvia.



IV. PREVENTIVE MEDICINE AND HYGIENE.

1. *Tuberculosis.*

At Riga, the only city for which we have accurate statistical data, 730 d tuberculosis have been noted, giving a specific mortality of 21.5 per ten inhabitants (690 deaths in 1924, specific mortality 21.4).

The anti-tubercular dispensary of the Riga Anti-Tuberculosis Society a sanatoria have been extremely active. Mention should be made of the openi of the new anti-tubercular dispensary at Liépaja (Libau) and the opening at ning of 1926 of a sanatorium for tubercular Government officials at Weid of a sanatorium belonging to the health insurance societies at Predaine. T Riga has begun the construction of a sanatorium with 120 beds at Bicke Riga).

2. *Leprosy.*

As the leper hospital at Talsi was closed in 1925, at present there only leper hospitals at Riga and at Césis (Wenden), in which there were, at the year 1925, 198 lepers, 13 of whom were new cases (as against 215 in 1924).

V. CURATIVE MEDICINE.

1. *Organisation and Administration of Hospitals.*

Latvia contained, in 1925, 79 general hospitals, including four lunati maintained by the State, 125 consulting rooms, 12 sanatoria, four thermal st two leper hospitals.

Amongst the innovations introduced in 1925 we should mention :

(a) The foundation of a general hospital at Riga for t community ;

(b) The opening of two sanatoria for tuberculosis ;

(c) The inauguration of two thermal stations at Kandava and at Baté.

2. *The Red Cross.*

In 1925, the Red Cross continued the work to which it has devoted itse foundation—the installation of hospitals, sanatoria and " health stations ing rooms), especially in districts where the resources of the State or comm insufficient to supply adequate medical attention. It founded six hospital Jelgava (Mitau), Daugavpils (Dwinsk), Plavinas (Stockmannshof), Irlava and quite recently the hospital of Smiltene, and contributed to the installat communal hospitals of Jecava, Atlava and Dobelé (Doblen). In 1925, it al rated six new " health stations " at Apé, Pokrov, Kuldiga (Goldingen), (Windau), Kandava (Kandau) and Riga. The latter is a model consulting the technical training of district nurses.

In 1925, 5,902 patients were treated in the Red Cross hospitals (4,928 and 838 patients underwent prolonged treatment in its five sanatoria (637 The eleven consulting-rooms were visited by 24,960 persons (24,500 in 192 " health stations " by 102,735 (93,466 in 1924). The orthopœdic worksh 646 artificial limbs (581 in 1924) and the motor ambulances carried 2,59 (1,924 in 1924).

VI. HEALTH PERSONNEL.

925, there were 951 doctors in Latvia, 557 being at Riga ; that is to say, e 5.2 doctors per 10,000 inhabitants, or 1 to 1,939 for the whole country, and tors per 10,000 inhabitants, or 1 to 610 at Riga. Their distribution over the s therefore somewhat unequal.

e were 519 dentists, including 345 at Riga ; 885 midwives, including 388 at 5 assistant doctors *(feldschers)*.

VII. GENERAL QUESTIONS.

nployment.

ia now possesses five labour exchanges in the towns of Riga, Jelgava (Mitau), (Windau) and Daugavpils (Dwinsk), the most important of which is that where more than 60 per cent of the total unemployed are registered. The l Bureau of Riga has undertaken to establish a distinction between the ed properly so-called—that is to say, skilled artisans out of work—and the s persons who, although totally unfamiliar with industrial labour (domestic educated persons without employment seeking any position, unskilled and apprentices), have so far been registered as unemployed in the labour s.

o the present, the statistics of the labour exchanges give the number of appli- r work but not the number of persons without work, and as it often happens ame person is registered in the exchange five, six or even ten times per month— say, whenever he has finished the work given him—these statistics are far ing an accurate idea of the situation, whence the necessity of adopting based on the number of persons and not on that of applications for work.

mparison of the figures for the year 1924, published in the previous Year- h those obtained by this new method shows that the number of unemployed disquieting than the earlier statistics led one to suppose. In 1925, the total ceeded 2,000, while if unemployment had reached the same proportions in in Germany (2,000,000 unemployed, *i.e.*, one thirty-third of the population) uld be from 50,000 to 60,000 unemployed.

Number of Unemployed Industrial Workers at Riga, 1924 and 1925.

	1924		1925
	Old method	New method	New method
January	3,717	1,404	1,706
February	2,783	1,450	2,153
March	3,183	1,220	1,692
April	2,408	1,371	1,485
May	1,794	835	1,283
June	1,102	496	650
July	1,079	403	680
August	1,053	289	430
September	1,181	296	496
October	1,563	354	486
November	2,186	650	910
December	2,277	1,082	1,532

However, there has been a certain increase in unemployment in 1925. The average from May 1st to October 1st, 1925, was 671 unemployed as agains 1924, which represents a 50 per cent increase. From January 1st to April this average was 1,759 unemployed as against 1,356 during the corresponding 1924, giving an increase of 30 per cent. During the months of November and ber 1925, this increase amounted to 41 per cent.

Public works have been undertaken to relieve the unemployed. In municipality of Riga employed 4,569 and the State 2,268.

2. *Cost of Living.*

The cost of living at Riga has not changed materially. The index figur calculated according to the method indicated in the previous Year-Book are as

	1925	1926		1925		
January	131.53	138.21	May	141.88	September	1
February	140.84	140.56	June	139.27	October	1
March	143.12	141.03	July	140.33	November	1
April	137.79	136.76	August	134.72	December	1

VIII. BIBLIOGRAPHY.

In addition to the works mentioned under the same heading in the Year- 1924, the reader should consult the following publications :

1. *Statistical Year-Book of Latvia*, 1924. Published by the Government St Bureau, Riga, 1925 (Tables with French text).

2. *Statistical Year-Book of the City of Riga*, 1923-24. Published Statistical Bureau of the City of Riga, 1926 (Latvian and French).

3. *Second Census of the Population of Latvia taken on February 10th*, 192 by M. Skujenieks. Published by the Government Statistical Bureau, Riga. I, II, III, IV and V, 1925-26 (Tables with Latvian and French texts).

4. *Latvian Red Cross Review*, 1925 (in Latvian).

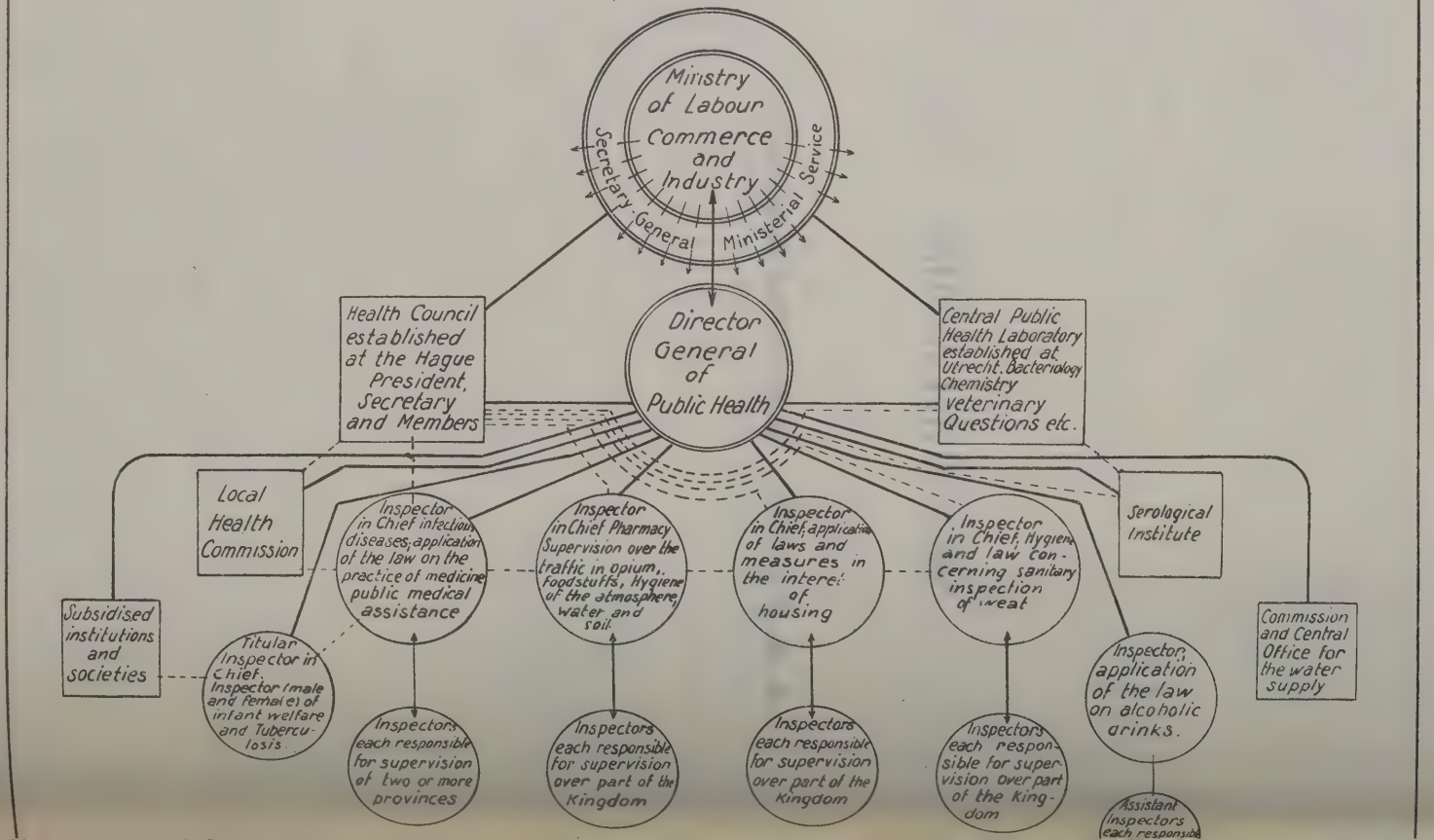
July 1926

NETHERLANDS

BY

J. A. PUTTO, M.D. (The Hague)

Plan of the Organisation of the Public Health Service in The Netherlands


Ministry of Labour Commerce and Industry
Secretary General
Ministerial Service
Director General of Public Health
Health Council established at the Hague President, Secretary and Members
Central Public Health Laboratory established at Utrecht. Bacteriology Chemistry Veterinary Questions etc.
Local Health Commission
Serological Institute
Subsidised institutions and societies
Titular Inspector in Chief. Inspector (male and female) of infant welfare and Tuberculosis
Inspector in Chief infectious diseases, application of the law on the practice of medicine public medical assistance
Inspector in Chief Pharmacy Supervision over the traffic in opium, Foodstuffs, Hygiene of the atmosphere, water and soil
Inspector in Chief, application of laws and measures in the interest of housing
Inspector in Chief, Hygiene and law concerning sanitary inspection of meat
Inspector, application of the law on alcoholic drinks.
Commission and Central Office for the water supply
Inspectors each responsible for supervision of two or more provinces
Inspectors each responsible for supervision over part of the Kingdom
Inspectors each responsible for supervision over part of the Kingdom
Inspectors each responsible for supervision over part of the Kingdom
Assistant Inspectors each responsible

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I. GENERAL INTRODUCTION.

area of the Kingdom of the Netherlands is 40,828 square kilometers, including aters. The actual land area is 32,600 square kilometers.

ulation.

(a) NUMBER OF INHABITANTS BY PROVINCES.[1]

Province	Number of inhabitants
North Brabant	801,702
Gelderland	781,216
South Holland	1,799,140
North Holland	1,388,509
Zeeland	248,900
Utrecht	376,552
Friesland	397,681
Overyssel	470,544
Groningen	383,670
Drenthe	222,443
Limburg	488,008
Total for the Kingdom	7,358,365

nmunes : over 100,000 inhabitants	1,805,968
50,001—100,000 inhabitants	577,932
20,001— 50,000 inhabitants	1,026,935
5,001— 20,000 inhabitants	2,115,268
5,000 inhabitants and under	1,832,262

) NUMBER OF INHABITANTS BY AGE-GROUPS ON DECEMBER 31ST, 1920 (DATE OF LAST CENSUS).

s	Male Population	Female Population
year	93,730	89,614
	76,636	73,339
s	74,160	71,494
s	75,309	73,161
s	76,111	73,816
ears	376,887	366,799
,	703,265	688,229
„	560,847	572,421
„	446,006	462,130
„	367,318	381,575
„	273,692	285,129
„	97,101	102,495
„	77,409	84,132
„	53,645	60,403
„	34,680	40,250
ver	23,445	30,036
known	21	29
Total	3,410,262	3,455,052

July 1st, 1925.

3. *Birth Rate.*

(a) NUMBER OF LIVE BIRTHS BY PROVINCES IN 1925 (RESIDENT POPULATI

Province	Number of live births	Rate 1,000 inh
North Brabant	23,969	29.
Gelderland	19,078	24.
South Holland	40,528	22.
North Holland	28,645	20.
Zeeland	5,227	21
Utrecht	8,780	23.
Friesland	9,141	23
Overyssel	117,444	25
Groningen	8,824	23
Drenthe	6,372	28.
Limburg	14,567	29.
Total for the Kingdom	282,575	24.
Communes : over 100,000 inhabitants	35,913	19.
50,001—100,000 inhabitants	12,361	21.
20,001— 50,000 inhabitants	25,079	24.
5,001— 20,000 inhabitants	55,216	26.
5,000 inhabitants and under	48,306	26.

(b) NUMBER OF BIRTHS BY PROVINCES OF CHILDREN DEAD BEFORE REGISTRA IN 1925 [1].

Provinces	Actual Figures	Rate p 1,000 Bi
North Brabant	928	37.
Gelderland	746	37.
South Holland	1,471	35
North Holland	1,004	33.
Zeeland	201	37
Utrecht	320	35.
Friesland	322	34
Overyssel	480	39
Groningen	272	29.
Drenthe	235	35.
Limburg	560	37
Total for the Kingdom	6,539	35.
Communes : over 100,000 inhabitants	1,409	37.
50,001—100,000 inhabitants	407	31.
20,001— 50,000 inhabitants	925	35.
5,001— 20,000 inhabitants	2,062	36
5,000 inhabitants and under	1,736	34.

[1] These include : premature still-births, full-term still-births, children delivered alive but who died before re tion, *i.e.*, during the three days following birth.

MBER OF CASES OF STILL-BIRTHS DELIVERED WITH OR WITHOUT OBSTETRIC ASSISTANCE IN 1924 BY PROVINCES [1].

ces and Groups Communes	Born with Obstetric Assistance				Born without Obstetric Assistance		Total		Number of Still-births of Male Children to every 100 Female	Number of Live Male Births to every 100 Female	Rate of Still-births	
	of a Doctor		of a Midwife									
	Male	Female	Male	Female	Male	Fem.	Male	Fem.			Male	Fem.
bant	269	212	85	61	9	5	363	278	130.6	106.0	2.8	2.3
.. .. ..	217	171	83	76	2	1	302	248	121.8	107.5	2.9	2.6
land	419	317	210	206	1	1	630	524	120.2	103.8	2.9	2.5
land	296	211	151	123	—	—	447	334	133.8	106.3	2.8	2.3
.. .. ..	64	46	12	8	—	2	76	56	135.7	105.9	2.7	2.1
.. .. ..	93	116	24	11	—	1	117	128	91.4	104.8	2.4	2.8
.. .. ..	112	89	13	24	2	—	127	113	112.4	109.8	2.5	2.5
.. .. ..	136	114	35	43	1	1	172	158	108.9	105.8	2.7	2.6
.. .. ..	70	95	75	11	—	—	145	106	136.8	103.8	3.0	2.3
.. .. ..	77	82	31	29	—	—	108	111	97.3	104.5	3.0	3.3
.. ..	110	76	63	79	3	1	176	156	112.8	105.4	2.2	2.1
s : over 100,000 itants	316	276	217	214	1	1	534	491	108.8	103.3	2.7	2.6
l—100,000 inhab.	102	80	76	57	—	1	178	138	129.0	107.1	2.6	2.2
l— 50,000 inhab.	259	175	118	109	—	1	377	285	132.3	107.3	2.7	2.2
l— 20,000 inhab.	612	541	222	176	11	5	845	722	117.0	106.5	2.8	2.6
0 inhabitants and	574	457	149	115	6	4	729	576	126.6	105.0	2.8	2.3
the Kingdom, 1924	1,863	1,529	782	671	18	12	2,663	2,212	120.4	105.6	2.8	2.4
the Kingdom, 1923	2,691	2,174	1,267	1,093	77	80	4,035	3,347	120.5	106.0	2.9	2.7

om the statistics published by the Central Statistical Bureau, it would appear *ill-births* are commoner in the smaller than in the more populous communes, ly because obstetric aid is less well organised ; since 1920, however, a greater r of still-births has been registered in the larger communes than in the smaller. should be pointed out that the considerable *excess of male births over female red after* 1919 seems to confirm the theory that, immediately after a war, more hildren are born than at any other period. The proportion of still-births of male children remains practically double that of legitimate children. his disproportion is, however, tending to become less marked.

tus under six months old are not included in the statistics for 1924.

4. *Morlality.*

(a) NUMBER OF DEATHS BY PROVINCES; ACTUAL FIGURES AND RATE PER INHABITANTS IN 1925.

Province	Rate per 1,000	Absolu
North Brabant	11.1	8
Gelderland	10.5	8
South Holland	8.7	15
North Holland	9.3	12
Zeeland	9.6	2
Utrecht	9.7	3
Friesland	10.1	4
Overyssel	9.6	4
Groningen	8.9	3
Drenthe	9.4	2
Limburg	10.–	4
Total for the Kingdom	9.6	70
Communes : over 100,000 inhabitants	8.7	15
50,001—100,000 inhabitants	9.4	5
20,001— 50,000 inhabitants	9.–	9
5,001— 20,000 inhabitants	9.9	20
5,000 inhabitants and under	10.4	19

(b) NUMBER OF DEATHS IN 1925, CLASSIFIED ACCORDING TO THE PRINCIPAL CAU

Typhoid fever	137
Measles (262 in 1924)	*602*
Scarlet fever (54 in 1924)	*115*
Whooping-cough	538
Diphtheria	257
Influenza	641
Other epidemic diseases [2]	293
Pulmonary tuberculosis	5,198
Cerebral tuberculosis	954
Other forms of tuberculosis	1,156
Organic diseases of the heart	8,254
Bronchitis (acute and chronic)	1,463
Lobar pneumonia	3,287
Other diseases of the respiratory system, excluding tuberculosis	4,544
Gastro-enteritis (under 2 years)	1,561
Nephritis and Bright's disease	2,422
Puerperal fever	153
Senile decay	5,329
Other diseases	33,793
Total (still-births not included)	70,697

[1] Approximate figures.
[2] Malaria, 5 ; Choleriform enteritis, 24 ; Dysentery, 17 ; Encephalitis lethargica, 59 ; Epidemic cerebro-spinal me
67 ; Acute anterior poliomyelitis, 9.

(c) NUMBER OF DEATHS BY AGE-GROUPS AND PROVINCES IN 1925.

and Groups / mmunes	Under 1 Year				1-4 years	5-14 years	15-19 years	20-29 years	30-39 years	40-49 years	50-59 years	60-79 years	80 and over, including Age unknown
	Under 1 Week	From 1 Week to 1 Month	1 Month to 3 Months	Total, including 3 Months to 12 Months									
bant ..	219	262	340	1,711	689	288	160	401	397	473	712	2,924	1,106
.. ..	127	173	216	1,022	609	266	203	360	371	467	735	2,922	1,168
land ..	246	240	299	1,542	954	580	389	836	815	1,038	1,650	5,655	2,219
land ..	177	140	200	1,077	666	401	277	679	651	879	1,469	4,915	1,883
.. ..	45	43	50	239	96	71	66	107	108	139	203	871	477
.. ..	49	58	93	434	279	104	96	214	194	219	356	1,423	484
.. ..	44	59	54	310	163	113	63	157	138	221	362	1,567	835
.. ..	91	109	128	646	333	143	105	238	207	273	430	1,608	599
.. ..	61	61	101	406	186	105	86	172	146	200	305	1,287	648
.. ..	41	60	68	332	169	80	39	101	101	110	170	611	299
.. ..	132	140	229	1,069	437	165	121	251	229	267	405	1,415	535
he Kingdom	1,232	1,345	1,778	8,788	4,581	2,316	1,605	3,516	3,357	4,286	6,737	25,198	10,253 [1]
:													
00,000 inhabitants .. —100,000	215	165	251	1,320	924	527	390	913	955	1,233	1,900	6,035	2,117
habitants .. — 50,000	104	98	144	693	432	243	147	358	313	430	692	2,247	861
habitants .. — 20,000	198	196	277	1,356	683	359	253	547	515	675	981	3,288	1,222
habitants .. inhabitants	371	431	559	2,804	1,350	623	426	944	867	1,070	1,769	7,136	3,125
d under ..	344	455	547	2,615	1,192	564	389	754	707	878	1,555	6,492	2,928

(d) NUMBER OF DEATHS BY AGE-GROUPS FROM 1895 TO 1924.

ears	1895-1904	1905-1914	1917-1924
1 year	165.45	119.02	71.60
.. ..	18.42	13.08	11.75
.. ..	3.25	2.39	2.28
.. ..	3.73	2.95	3.21
.. ..	6.56	5.19	5.30
.. ..	19.23	17.46	16.16
.. ..	64.43	60.51	60.32
d over	187.20	191.62	187.53

e Central Statistical Bureau has chosen these three periods so that the date of us which serves as a basis for the calculations (December 31st, 1899, December 09, and December 31st, 1920) should in each case fall in the middle of the

ding 4 over 102 years of age, 3 over 101 and 4 over 100.

(e) NUMBER OF DEATHS WITHOUT MEDICAL ATTENDANCE, CLASSIFIED ACC
TO PRINCIPAL CAUSES (PERCENTAGE RATE).

Cause	1905-1909	1910-1914	1915-1919	1920	192
Measles	3.2	2.6	1.6	1.0	1.
Whooping-cough	3.0	2.1	1.1	1.2	1.
Alcoholism	14.5	11.7	9.5	21.2	9.
Apoplexy	3.8	2.4	2.0	2.0	1.
Organic diseases of the heart	1.7	1.3	0.9	0.8	2.
Convulsions	10.1	8.3	6.8	7.2	5.
Bronchitis	2.4	1.6	1.6	1.3	1.
Diseases of the stomach	2.8	2.6	1.3	0.8	1.
Gastro-enteritis	3.5	3.0	2.3	1.9	2.
Congenital debility	5.7	4.4	2.6	2.5	2.
Senile decay	2.9	2.1	1.7	1.3	1.
Violent death	23.6	21.5	18.2	15.5	11.
Drowning	36.3	32.0	29.2	25.9	19.
Gas-poisoning	32.3	26.5	21.8	18.9	19.
Sudden death	38.9	30.7	23.0	32.9	27.
Pedatrophy	3.3	2.5	2.5	1.0	1.
Other diseases of the respiratory system	1.3	1.0	0.7	0.7	0.
Cause of death unknown	58.5	54.4	46.4	42.7	37.
Total	6.8	5.3	3.9	3.5	3.

5. *Infant Mortality.*

(a) NUMBER OF DEATHS BY PROVINCES
(ACTUAL FIGURES AND PERCENTAGE RATE OF LIVE BIRTHS).

Province	Deaths: Number of Deaths	Deaths: Percen of Li
North Brabant	1,715	
Gelderland	1,028	
South Holland	1,534	
North Holland	1,074	
Zeeland	238	
Utrecht	428	
Friesland	320	
Overyssel	638	
Groningen	393	
Drenthe	336	
Limburg	1,063	
Total for the Kingdom	8,767	
Communes : over 100,000 inhabitants	1,255	
50,001—100,000 inhabitants	548	
20,001— 50,000 inhabitants	1,267	
5,001— 20,000 inhabitants	2,928	
5,000 inhabitants and under	2,769	

NUMBER OF DEATHS CLASSIFIED ACCORDING TO CAUSES AND AGE-GROUPS (ACTUAL FIGURES).

ıse	Ages in Days					Under 1 Month	Ages in Months											Under 1 year
	-1	1-7	8-14	15-21	22-30		1+	2+	3+	4+	5+	6+	7+	8+	9+	10+	11+	
.. .. ..	—	—	—	—	1	1	1	1	2	4	5	15	17	28	24	24	32	540
(9)	—	2	—	2	6	10	40	22	26	33	19	23	18	23	24	22	20	280
rculosis (31) ..	—	—	—	1	—	1	1	4	3	8	5	8	12	10	9	9	9	79
berculosis (32-37)	—	—	—	—	2	2	3	8	16	21	8	20	11	18	21	18	12	158
.. .. ..	1	5	9	7	1	23	10	11	7	5	—	—	2	—	5	1	1	65
.. .. ..	2	63	34	34	33	166	95	101	90	63	54	50	53	43	40	34	34	823
nia (100) ..	3	7	20	21	22	73	70	81	82	80	95	103	101	95	110	91	87	1,068
onia (101) ..	—	7	6	6	8	27	24	34	44	39	35	55	61	45	47	44	40	495
the respiratory																		
99, 102-108) ..	—	3	8	6	3	20	39	27	24	14	18	28	18	12	26	19	16	261
113)	3	7	23	57	79	169	238	198	205	136	115	87	68	61	58	47	37	1,419
161*a*, 206*bis*) ..	54	674	251	192	116	1,287	212	108	66	37	13	16	17	8	4	6	5	1,779
iseases (162,163)	1	27	21	17	8	74	11	4	—	—	1	1	—	—	—	—	—	91
death	25	348	139	112	100	724	241	194	152	121	112	111	103	85	96	96	81	2,116
.. ..	89	1,143	511	455	379	2,577	985	793	717	561	480	517	481	428	464	411	374	8,788
ll deaths from rresponding to oup	1	13	5.8	5.2	4.3	29.3	11.2	9	8.2	6.4	5.5	5.9	5.2	4.9	5.3	4.7	4.3	100

in parentheses indicate the numbers in the International List.

(c) NUMBER OF DEATHS BY PROVINCES ACCORDING TO SEASONS (RATE PER 1,000 LIVE BIRTHS).

Groups nes	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
.. ..	82.2	82.8	92	69.3	63.5	55.6	62.6	71.8	72.8	61	64.2	78.7
.. ..	59.8	57.8	77	62	47.9	36.9	40.6	54.7	38	43	51.6	74.1
.. ..	40.4	39.1	42.1	41.4	35.2	36.3	28.6	33	30.6	31.5	35.3	56.7
.. ..	47	37	48	44.1	38.5	33.3	32.5	30.2	26	29.4	28.8	46.5
.. ..	41.6	38.6	60.9	70	48.4	29.8	33.2	10	39.2	40.6	44.2	49.6
.. ..	53.2	53.1	64	51.4	38.8	40.6	40.4	36.7	51.4	37.1	49.8	53.7
.. ..	42.1	33	46.6	21.1	33.1	29	43.5	28.2	17.2	32.2	34.4	56.7
.. ..	40	65.2	49.8	81.2	51.8	44.3	64.7	64.9	48.9	46.2	38.5	57.2
.. ..	34.6	45.9	48.2	49.5	60.4	50.7	31	45.7	43.5	34.3	34.2	45.4
.. ..	56.5	51.2	82.8	78.3	35.4	46.2	44.8	52.3	56.1	25.7	41.9	42.5
.. ..	77.7	78.7	93.2	89.9	64.2	52.7	58.8	74.1	76.9	58.1	70.2	78.5
or the gdom ..	53.2	52.7	61.9	56.5	46.1	41.1	42.2	47.1	43.5	40.1	44.1	60.3
r 100,000	37.1	33.5	41	38	37	32.9	30.9	24.5	23.7	29	33.5	49.2
00,000 in-ts ..	59.9	58.4	53.7	46.6	26.2	34.9	31	39.6	36.2	30.2	49	61.9
000 inha-	59.4	52.5	56.5	59.9	40.2	36.2	40.9	48	49.3	45.5	44.2	69.9
00 inha-	55	55.6	67.7	56.1	51.1	42.7	46.6	55.4	52.5	41.3	48.5	61
ants and	58.4	62.7	75.9	71.5	55.3	49.5	49.2	55.9	46.9	46.6	45.6	62.2

6. *Budget.*

General Budget : 782,331,621 florins.

Budget of the Ministry of Labour, Commerce and Industry : 61,204,492

PRINCIPAL ITEMS OF THE HEALTH BUDGET.

		F
Subsidies for housing		14,8
Food control		1,5
Tuberculosis and lupus (1,100,000 + 3,000 florins)		1,1
Schools for midwives		
Salaries (those of the Public Health Board included)		
Central Public Health Laboratory	125,220	
State Serotherapeutic Institute	53,790	
Pharmacotherapeutic Institute	31,450	
Campaign against epidemics and quarantine stations		
Water supply		
Child welfare		
Grants in aid of local health work		
Campaign against alcoholism		
Cancer		
Epilepsy		
Venereal diseases		
Total		19,8

II. HEALTH LEGISLATION AND ADMINISTRATION.

1. *Dentistry.*

The Law of June 29th, 1925 (*Legal Gazette*, No. 282) adds the following pa to Article 10 of the last text of the Law of June 24th, 1876 (*Legal Gazette*, N

" Persons who, although they are not fully qualified dentists, have profes performed all operations of dental prothesis prior to June 10th, 1913, and w a technical training considered adequate by the Minister responsible for the ex of the present law, shall be allowed to continue to practice dental prothesis.

2. *Food Control.*

List supplementary to that given in the *Year-Book* for 1924, pages 276 a

Decree of January 13th, 1925, concerning coffee and tea (*Legal* No. 13) ;

Decree of June 22nd, 1925, concerning milk (*Legal Gazette*, N

General Decree of June 23rd, 1925, concerning foodstuffs *Gazette*, No. 262) ;

Decree of July 4th, 1925, amending the Decree concerning mil *Gazette*, No. 313) ;

Decree of August 4th, 1925, concerning washing preparation *Gazette*, No. 345) ;

Decree of August 7th, 1925, concerning honey (*Legal Gazette*, N

Decree of October 16th, 1925, concerning margarine (*Legal Gazette*, No. 417) and

Special Decree of October 19th, 1925, concerning fats (*Legal Gazette*, No. 421) ;

Decree of July 4th, 1925, amending the Decree concerning chocolate (*Legal Gazette*, No. 317) ;

Decree of December 21st, 1925, concerning bread (*Legal Gazette*, No. 478).

e following supplementary information concerning certain of these decrees of interest :

cree concerning Milk.—This decree prohibits the addition to or withdrawal ilk of any substances. Half a litre or smaller quantities passed through n filter should only leave slight traces of impurity. Milk must not contain treptococci or other pathogenic micro-organisms. No milk from animals g from inflammation of the udder, or intestinal inflammation accompanied by a, or inflammation of the uterus accompanied by frequent discharge, or from m of tuberculosis with suppuration (external tuberculosis) may be sold for use ; nor must the animals have wounds likely to lead to dangerous contamiof the udder, teats or milk by means of pus or other excretions.

ws must not be milked until the udder and neighbouring parts have been hly cleansed. The animals must be mil ked, and the milk kept and handled upulous cleanliness ; immediately after milking, the milk must be filtered and d from the stables, and must be kept in a place out of reach of all offensive

k and milk products must neither be handled nor transported by persons in contact with a case of typhoid fever, nor must milk be handled in places here is typhoid fever unless the milk is sterilised. The inspector of the Epidemics may, however, grant exemptions. When all danger of infection has been d, a medical certificate must be submitted to the Director of the Food Control

k and milk products must not be handled or transported by persons who have ported by the inspector or a doctor to the burgomaster as suffering from an n of the head, hands or skin.

rther, the decree provides that milk and milk products must not be placed in cles or be handled or kept in a living-room or bedroom or in one occupied by sons ; the aforesaid operations must neither be carried out in a place which is arated from a room used as a living-room or bedroom or in one occupied by rsons, nor in any place which cannot be adequately aired, lighted or cleaned. e decree also lays down regulations concerning transport. It does not apply products intended for export.

neral Decree concerning Foodstuffs.—This decree lays down rules indicating ces in which foodstuffs and beverages may be prepared, packed and handled. aces must not be used as bedrooms, living-rooms, stables or cattle sheds. ree also contains regulations concerning the water supply.

odstuffs and beverages must be prepared, packed, stored, handled and transwith scrupulous cleanliness and under such conditions that the products kept free from all contamination.

icle 4 of the General Decree is important and is worded as follows :

" After being gathered, picked or dug up, vegetables, fruits, roots and tubers which can be eaten raw must not be washed in water which the

burgomaster and the aldermen of the commune on the territory of the water is drawn have declared as unfit for that purpose. "

Foodstuffs and beverages must not be prepared, packed or handled in bu in which there has been a case of typhoid fever, paratyphoid, dysentery or c nor must they be removed from such a building without a written authorisatio the burgomaster. This authorisation will not be granted without the appro the inspector of the Epidemics Service, who must first consult the director Food Control Service.

Decree concerning Bread.—Reference has already been made in the last *Book* to the Decree of 1922. The provision concerning germ-carriers has been o from the new decree, nor does the Decree concerning milk refer to this par point. The draft Law concerning infectious diseases (1924), which has not ye discussed, lays down regulations concerning this question.

3. *Infectious Diseases and Pharmaceutical Specialities.*

The draft Laws concerning infectious diseases and pharmaceutical speci mentioned in the *International Health Year-Book for* 1924, have not yet been dis by the States-General.

Various decrees (concerning meningitis, encephalitis lethargica, acute a poliomyelitis) have again been put into force.

A Royal Decree dated February 24th, 1925 *(Legal Gazette*, No. 47), lays exceptional measures for preventing the spread of smallpox and its consequ a Royal Decree dated March 3rd, 1925 (*Legal Gazette*, No. 57), lays down excep measures for the prevention of the plague and Asiatic cholera. (These decree into force on March 1st and April 28th, 1925, respectively.)

A Royal Decree dated May 8th, 1925 (*Legal Gazette*, No. 18), lays down provisions concerning the sanitary inspection of ships.

4. *Special Provisions concerning Offences committed by Persons of unsound*

The Law dated May 28th, 1925, supplements and modifies the existing pro concerning penal law and penal procedure in the case of persons recognise unsound mind who have committed an offence.

The following penalties have been laid down : (1) Confinement in a penitentiary institution ; (2) Fines.

Should the person be recognised to have been of unsound mind at the committing the offence, the judge may recommend that confinement in a penitentiary institution be substituted for the fine. The period of confinemer be not less than one week and not more than one year (in certain cases it sixteen months).

At present, Holland possesses one special penitentiary institution at Scheve with a mental specialist at its head.

5. *The Practice of Medicine.*

In January 1925, a Bill concerning medical practice was tabled. Th following sections of this Bill concern doctors, dentists and midwives in part

1. Regulations concerning the practice of medicine ;
2. Disciplinary measures ;
3. Authorities responsible for their application.

The regulations concerning the practice of medicine provide that :

(a) Any doctor found guilty of misconduct or other actions to bring discredit on the medical profession as a whole ;

(b) Any doctor found guilty of negligence causing serious injury to his patient ;

(c) Any doctor who, in the exercise of his profession, gives proof of crass ignorance,

be liable to one of the five following penalties :

(a) Warning ;
(b) Reprimand ;
(c) Fine not exceeding 3,000 florins ;
(d) Suspension for a period of not more than one year ;
(e) Prohibition to continue the practice of medicine.

Special boards are responsible for the application of the law in the first instance, in case of appeal, the matter is referred to a central board ; these boards are posed of four doctors (two of whom must be replaced by two dentists or two mid- s where a decision has to be adopted with regard to a dentist or a midwife) and urist. One of the doctors acts as chairman.

Health Organisation.

The graph on page 330 and that on page 344 illustrate the health organisation olland. For further details, the reader is referred to Dr. Josephus Jitta's work, *Organisation of the Public Health Services in the Kingdom of the Netherlands* ment C. H. 209).

Press Service attached to the Public Health Council.

The Minister of Labour, Commerce and Industry has authorised the Public Health cil to create an information service for the purpose of organising regular propa- a in health matters and prophylaxis through the medium of the Press. This ce began its work on January 1st, 1926, and has become so popular that about ewspapers and weekly reviews have already requested that " Advice concerning ıylaxis and Public Health " should be sent to them.

Teaching of Hygiene.

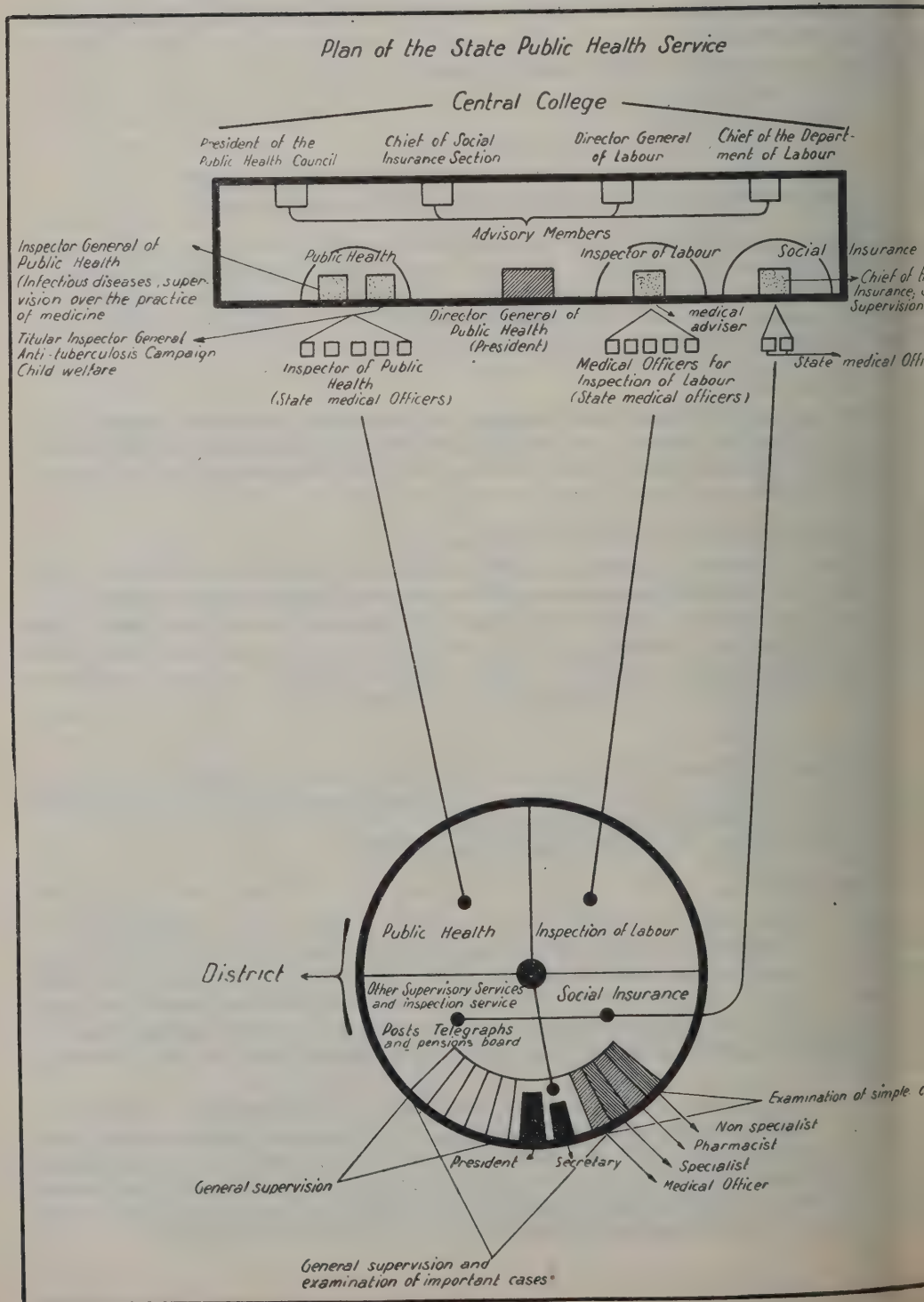
A Commission composed of members of the Public Health Council has drawn up abus for regular instruction in hygiene. The Faculty of Medicine at one or more rsities will be responsible for this instruction.
The first course was to open at Amsterdam in 1926.

Occupational Diseases.

a) *Use of White Lead.*—In order to prevent the dangers arising from the use of white lead, a Commission composed of members of the Public Health Council proposed the adoption of regulations forbidding wholesale merchants and white factories to supply the product in powdered form ; the Commission also proposes opt measures for preventing the use of dry white lead except in factories. It opinion that the prohibition of the import of dry white lead might ultimately nsidered.

b) *Dangers of X-Rays.*—On January 20th, 1925, a Commission composed of bers of the Public Health Council decided to investigate the dangers arising from se of X- or similar rays and the means of preventing them. The Commission red a report based partly on experiments made by some of its members, and recom- ed that the Minister of Labour, Commerce and Industry should lay down certain for the use of X- and similar rays based upon the following principles :

NETHERLANDS



X-rays shall not be generated or applied for any purpose whatever except itutions duly authorised to do so by the State. The granting of such an risation may be made contingent upon the fulfilment of certain conditions erations of any kind shall be made to the apparatus referred to above without sion from the Authorities.

The permission to apply the above-mentioned rays to man, referred to in aph 1, shall only be granted to institutions which are under the direction of a authorised to practise medicine in Holland.

Permission to use X-rays for other than medical purposes shall only be d if it can be proved that the rays are required for scientific or technical purposes.

Before granting a licence, the State shall instruct experts to make investi- concerning the institution which applies for it.

Permission shall only be granted subject to certain conditions, the details of shall be laid down by the administrative authorities

the institution does not satisfy the conditions referred to in paragraph 1, the sion shall be withdrawn.

Destruction of Rats.

n active campaign is at present being carried on in the Press on the question r public funds should be devoted to the destruction of rats, and whether the preparations containing microbes, more especially " Ratin ", is dangerous.

Commission composed of members of the Public Health Council has discussed cond of these questions, and has pronounced against the promiscuous use of ations containing microbes without the supervision of a doctor or a health

Dr. H. Peeters, the Medical Health Officer for the Army, stated that he rongly against the use by the army of preparations containing microbes ; enkel, Director of the Veterinary Service at the Central Laboratory, is also tically opposed to the use of such preparations.

III. CAMPAIGN AGAINST SOCIAL DISEASES.

uberculosis.

in the periods 1906-10 and 1911-15, the number of deaths from tuberculosis is sing. In 1923 and 1924, the death rate from pulmonary tuberculosis was 7.29 20 respectively per 10,000 inhabitants, 8.48 in respect of males and 8.63 of s. In 1925, the rate was 7 (it should, however, be noted that the new Nomen- of Causes of Death was introduced on January 1st, 1925)[1].

ut of a population of 7,358,365, 5,198 deaths from pulmonary tuberculosis egistered in 1925—954 from tuberculosis of the meninges and 1,156 from other f tuberculosis.

e following table shows the death rate from tuberculosis per 10,000 inhabitants :

Pulmonary Tuberculosis	Other Forms of Tuberculosis	Total
7.03	2.85	9.88

e death rate from pulmonary tuberculosis is getting higher for females than for at any rate in the total returns for the Netherlands (Amsterdam is an excep-

[1] ary tuberculosis and general chronic tuberculosis, which were formerly classed under the heading "Pulmonary sis ", are now shown under " Other Forms ".

tion). The proportion between the rates registered for the two sexes was 100 : 1923 ; and rose to 100 : 120 in 1924. Taking all forms of tuberculosis into acco greater number of deaths still occur among females ; in 1924, the proportio 1 : 1.15.

The figures classified according to age-groups for the year 1921 give the foll table, which was published in the death statistics for the year 1924.

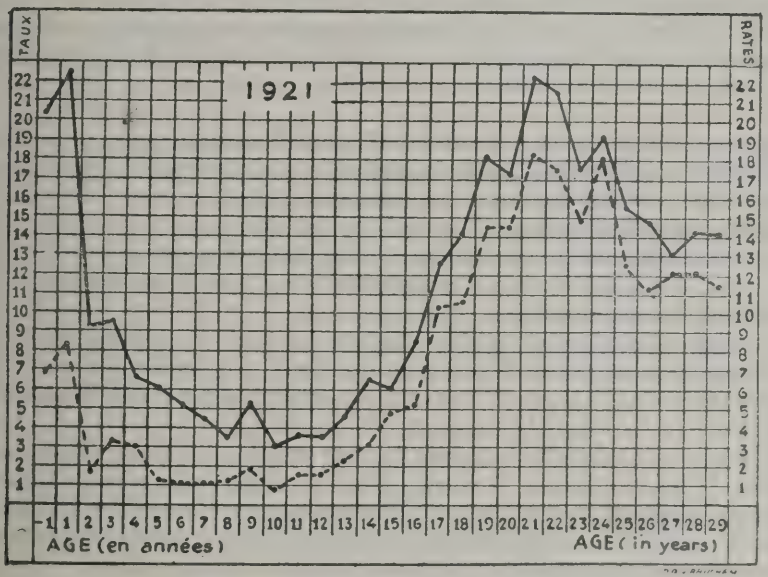
Age	Population according to the 1920 Census		Number of Deaths from				Number of Deaths per 1,000 Inh at the age indicated in the first		
			Tuberculosis of all kinds		Pulmonary Tuberculosis		Tuberculosis of all kinds		Pulmon Tuberc
			1921						
	M.	F.	M.	F.	M.	F.	M.	F.	M.
– 1	93,730	89,614	190	173	64	74	2.03	1.93	0.68
1	76,636	73,339	172	145	64	42	2.24	1.98	0.84
2	74,160	71,494	69	62	13	19	0.93	0.87	0.18
3	75,309	73,161	72	67	25	18	0.96	0,92	0.33
4	76,111	73,816	50	55	22	21	0.66	0.75	0.29
5	74,450	71,916	45	36	10	16	0.60	0.50	0.13
6	78,310	76,030	42	40	9	15	0.54	0.53	0.12
7	76,935	75,139	34	32	9	15	0.44	0.43	0.12
8	76,436	74,189	26	38	11	17	0.34	0.51	0.14
9	70,756	69,525	38	39	13	21	0.54	0.56	0.18
10	72,890	70,797	22	38	6	17	0.30	0.54	0.08
11	73,814	72,072	27	48	12	23	0.37	0.67	0.16
12	73,142	71,468	26	41	12	23	0.36	0.57	0.16
13	72,274	70,627	33	59	17	37	0.46	0.84	0.24
14	70,636	69,418	47	59	22	37	0.67	0.85	0.31
15	70,171	68,800	43	93	34	69	0.61	1.35	0.49
16	69,735	68,187	59	104	37	83	0.85	1.53	0.53
17	67,835	66,386	86	124	70	91	1.27	1.87	1.03
18	67,831	66,204	95	123	72	106	1.40	1.86	1.06
19	64,937	64,270	118	116	94	97	1.82	1.81	1.45
20	61,646	61,544	107	106	90	91	1.74	1.72	1.46
21	60,415	60,762	135	136	111	116	2.24	2.24	1.84
22	59,241	59,835	128	110	104	95	2.16	1.84	1.76
23	58,535	59,792	103	119	87	100	1.76	1.99	1.49
24	58,003	59,033	112	126	105	105	1.93	2.13	1.81
25	55,422	56,733	86	100	70	85	1.55	1.76	1.26
26	53,888	55,602	80	108	61	98	1.49	1.94	1.13
27	53,791	55,409	70	97	66	87	1.30	1.75	1.23
28	49,632	51,606	71	98	61	86	1.43	1.90	1.23
29	50,274	52,105	71	103	58	88	1.41	1.98	1.15

The graphs on the following page, taken from the *Manual of the Anti-culosis Campaign*, were drawn from the figures given in this table.

No change was made in the organisation of the campaign against tuber during 1925. It is carried on both by private enterprise and under the direct the State. The service of the dispensaries is being developed under the direct specialists in tuberculosis. On January 1st, 1925, 534 associations were working 33,953 families. The province of North Holland has decided to grant a subsi the treatment of tuberculous patients, calculated according to the number of i tants. in pursuance of the regulations adopted by the State. As a general ru

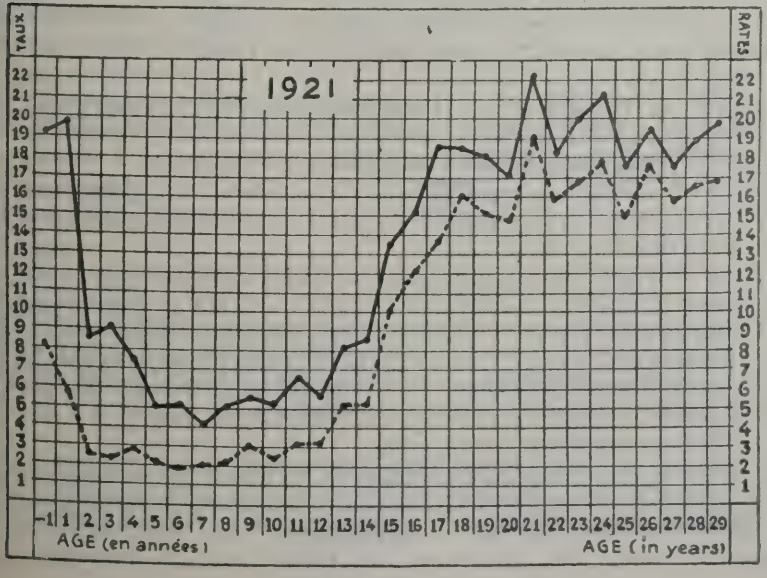
tality from Tuberculosis all Forms _____ and from Pulmonary Tuberculosis .....

RATES PER 10,000 POPULATION (MALES).



tality from Tuberculosis all Forms _____ and from Pulmonary Tuberculosis .....

RATES PER 10,000 POPULATION (FEMALES).



commune pays 5 cents per inhabitant on condition that the communal auth undertake to add at least 5 cents and to pay 10 cents per head to the local anti- culosis associations. A maximum sum of 500 florins has been fixed for com with less than 10,000 inhabitants.

At the beginning of 1926, it was laid down that all tuberculous patients the associations wished to send to sanatoria must previously be examined doctor in charge of the dispensary. If the association does not agree t condition, it forfeits all rights both to the State grant and to the grant from Holland.

From January 1st, 1925, the province of Gelderland has granted an annual s of 15,000 florins to the provincial anti-tuberculosis association ; this sum is to b to cover part of the cost of treatment of patients in the province who receive hel local associations in Gelderland. Certain conditions must, however, be ful patients can only be treated in sanatoria or hospitals recognised by the Public Department ; the association must guarantee the payment of two-thirds hospital expenses for each patient.

Patients who are treated under the Invalidity Law need not under preliminary examination by the dispensary doctor. About 60 per cent of the p treated or admitted to hospital under the provisions of the Invalidity La tuberculous.

In 1925, special attention was given to the problem of post-sanatorial trea Institutions for " labour cures " were opened at Deventer and Enschede. apparently, very difficult to find locally the necessary funds for the upkeep o establishments. In order to facilitate purchases, etc., a central committee organisations for post-sanatorial treatment has been established. The Com appointed by the Central Netherlands Anti-Tuberculosis League for the pur considering the question of post-sanatorial treatment has submitted a report, appeared at the beginning of 1926 ; it recommended the appointment of loc provincial committees to deal with post-sanatorial treatment in conjunction w local anti-tuberculosis associations.

In 1925, a popular film on tuberculosis, called " Every Cloud has a Silver Li was produced. It was much appreciated both in Holland and by the health who took part in the exchanges organised by the Health Section of the Lea Nations.

The sanatoria at Hoog-Laren, Hoog-Blaricum and Sonnevanek (Harde belonging to the city of Amsterdam, have been extended. A small sanatori tuberculous patients has been erected at Delft.

The problem of sanocrysine is still under consideration. Dutch clinics ap think that sanocrysine may be used as a remedy in certain cases, but that it suitable for indiscriminate use.

The question of B.C.G. vaccine has also aroused much interest. Some auth are most enthusiastic about this treatment while others are less sanguine. Schuurmans Stekhoven (Utrecht) published a thesis on this problem in 1926 veterinary service has made experiments on new-born calves with B.C.G. vaccin Director of the service was satisfied with the provisional results of these experi but a definite opinion cannot be given until some years hence, because, as a rule, live-stock is renewed every five years.

In 1925, 161 women obtained diplomas as official visitors employed in th tuberculosis campaign. The majority are now working as visiting nurses.

The profits on the sale of the " Emmabloem " are still increasing. In sum of 109,482.78 florins was collected ; in 1925, the sum amounted to 110

The sanatoria and the Central Netherlands League have received a total 16,709.38 florins ; the remainder of the sum was kept by the associations.

e report published in the *Year-Book for* 1924 stated that the Minister for War omised to institute an enquiry into the prevalence of tuberculosis in the As a result of an exhaustive investigation, he announced that the death rate berculosis in the army was indeed high and that measures had been taken to a stricter supervision.

iereal Diseases [1].

e State, the communes and the Netherlands Anti-Venereal League are carrying ctive campaign. In 1925, the League received a grant of 10,000 florins from te.

e State organises courses of instruction on venereal diseases. Attendance at urses and a term of probation at a clinic for venereal diseases are essential in obtain a diploma of doctor of medicine.

e University of Utrecht and the Communal University at Amsterdam already chairs of venereology. A new chair of dermatology and venereology has been at the State University of Groningen. At Leyden, a deputy lecturer is ble for the teaching of venereology.

e three State Universities and the Communal University at Amsterdam have free polyclinics for the treatment of venereal diseases, and the polyclinic at en was reorganised in 1925.

ommunal polyclinic has been in operation for some years at Rotterdam. It is y and night and very well attended. It gives free treatment to sailors of all ities ; since 1925, medical assistance and medicaments have also been given he indigent poor of the communes round Rotterdam.

e association known as the Leyden-Rotterdam Institute of Tropical Medicine ied a free polyclinic in 1925 close to the harbour. It is open to sailors of all ities ; in spite of the existence of the communal polyclinic, statistics concern- attendance of patients at the new institute show that it supplies a real need.

1925, Amsterdam reorganised its service of communal polyclinics for the treat- venereal diseases. At present, the town has three free anti-venereal dispen- in addition to the numerous polyclinics supported by the sickness insurance ions—one of which is close to the harbour and is specially reserved for sailors. stablishments are open day and evening.

e Netherlands Anti-Venereal League has created local committees and ied centres for free consultations in the following towns :

Amsterdam,	Nimeguen,
Rotterdam,	Heerlen,
Utrecht,	Haarlem,
Groningen,	Leyden.

consultation centres do not treat patients ; they confine themselves to ng the persons who present themselves and sending to polyclinics, etc., those e found to be infected ; examining and advising persons who have had disease ; examining and advising persons who ask to be examined before e.

ce 1925, the Amsterdam Dispensary also undertakes the medical examination about to marry when they are sent by the new dispensary which the Asso- for Examination before Marriage has established at Amsterdam.

[1] nunicated by Dr. W. F. Veldhuijzen, Secretary of the Netherlands Anti-Venereal League.

Anti-venereal institutions give help to all applicants. Their aim is to giv material aid and the necessary moral support to ensure that the treatment pr by the specialists is carried out. Financial aid is only granted if the patien otherwise be obliged to discontinue his treatment.

The communal polyclinics at Amsterdam in 1925 successfully intro system of regular supervision of patients after treatment.

The association is also doing its utmost to instruct the public concer dangers of venereal disease. At Amsterdam in 1925, it organised, with the pality and professors of the University, a series of nine lectures on the psych puberty and sexual morality. These courses were attended by a large nu students, professors and teachers. They constitute the first effort made in the lands to give teachers university instruction concerning sexual questions.

In accordance with the programmes drawn up by the International Unio the Venereal Peril, of which it is an original member, the Netherlands Anti- League in 1925 inaugurated a compaign with a view to supplying sailors with h amusements in the great Dutch ports.

Venereal diseases are not compulsorily notifiable in Holland and it is t impossible to give a statement of facts based upon definite statistics, but it said that these diseases, and syphilis in particular, have decreased since the w

3. *Malaria.*

The destruction of larvæ by paraffining the ditches has only been carrie a large scale at Alkmaar (with the assistance of the commune of Bergen) Amsterdam. Altogether 350,000 square meters were subjected to this treatm 1,283 kilograms of paraffin were used. The Scientific Commission is of opini in low-lying country, the general application of this process is not to be recom

During 1925, subsidies were granted not only by the State but also by the of North Holland : the latter grants a contribution equal to the total sum w various communal authorities of North Holland devote annually to the anti- campaign. The maximum contribution from each commune in North Holland at 3,750 florins. Applications were addressed to the 118 communes, and 93 subsidies. The second Commission has grouped the local commissions into trict committees. The provincial commission appoints an inspector for each who works under the supervision of the chief superintendent and in relation w district committee. These inspectors have had special notices posted in the rooms of doctors, in hospitals, schools, etc.

The Commission stated that it was hindered in the execution of its wor fact that quinine pills and tablets are sold by druggists, grocers and confection

When house-to-house visits were first made, 16 per cent of the 8,351 visited were already destroying mosquitoes of their own accord, in 1925, the pe on 8,343 families was 25.5.

The Malaria film has been inproved and completed at the expense of Cross. It has been produced 47 times.

4. *Alcoholism.*

The Public Health Department is the central authority which enforces th cation of the law on alcoholic beverages and carries on a campaign against the e consumption of alcoholic liquors.

The material increase in the octroi duties, although not excessive, has upon the consumption of spirits ; the sale of spirits in the cafés is gradually dec

igh rate of octroi duties tends to encourage fraudulent imports and clandestine
ture.

must therefore admit that the " official consumption ", *i.e.*, the consumption
lated according to the revenue from octroi duties, is far less than the actual
otion. Certain members of temperance societies are even asking for the
n of octroi duties.

Law of June 29th, 1925 (*Legal Gazette*, No. 280), lays down that hotels shall no
erve their resident visitors with spirits unless they hold a special licence.

Royal Decree of October 14th, 1925 (*Legal Gazette*, No. 416), lays down the
ns upon which that licence shall be granted.

lre.

President of the Public Health Council has addressed to the heads of hospitals
yclinics a Circular Note accompanied by a printed form upon which must be
the number of patients who applied for treatment during the years 1920, 1921,
23 and 1924, and showed symptoms of goitre or other symptoms apparently
he hypertrophy of the thyroid gland.

1. *Number of Cases of Infectious Diseases classified according to Seasons and Number of Deaths caused by these Diseases in the Various Provinces of the Kingdom in 1925. (Provisional Figures)* [1].

Provinces	Typhoid fever		Typhus		Smallpox		Scarlet fever		Diphtheria		Dysentery		Epidemic cerebro-spinal meningitis		Acute anterior poliomyelitis		Encephalitis lethargica	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Friesland	33	3	—	—	—	—	162	2	127	10	—	—	4	3	2	—	6	1
Overyssel	66	8	—	—	—	—	255	2	499	39	117	11	4	2	5	—	17	9
Groningen	49	5	—	—	—	—	265	4	93	18	19	—	3	—	3	1	11	3
Drenthe	16	3	—	—	—	—	145	—	159	6	16	4	4	3	—	1	1	2
North Holland	279	35	—	—	—	—	3,363	19	1,468	39	23	1	30	19	5	—	22	13
Utrecht	73	10	—	—	—	—	818	6	218	11	—	—	10	4	1	1	5	4
South Holland	362	42	—	—	2	—	5,127	57	1,198	56	2	—	30	17	6	4	23	8
Zeeland	24	3	—	—	—	—	96	—	84	5	—	—	—	—	1	1	1	4
North Brabant	95	12	—	—	—	—	674	12	223	20	1	—	2	2	2	—	7	6
Gelderland	118	11	—	—	—	—	498	8	372	20	1	—	10	8	5	1	17	6
Limburg	44	5	—	—	—	—	225	5	278	33	1	1	18	9	2	—	10	3
Total for the Kingdom	1,159	137	—	—	2	—	11,628	115	4,719	257	180	17	115	67	32	9	120	59

[1] A table showing the number of cases of compulsorily notifiable diseases and of deaths due to these diseases notified in 1925 is given in *Epidemiological Intelligence*, No. 10, page 134.

allpox: Number of Vaccinations and Revaccinations in 1925.

ovince	Number of Persons vaccinated and revaccinated	Age of Persons vaccinated or revaccinated						Number of Persons vaccinated and revaccinated per 1,000 Inhabitants
		0-1	1-3	3-6	6-12	Over 12	Unknown	
abant	19,931	2,853	11,297	5,259	479	43	—	24.86
nd	17,570	1,217	7,146	7,790	1,325	92	—	22.49
olland ..	40,037	1,251	11,696	23,683	2,793	608	6	22.25
olland ..	26,732	945	11,286	12,857	1,375	269	—	19.25
.. ..	4,908	178	1,667	2,651	391	21	—	15.70
.. ..	7,983	110	2,899	4,212	653	109	—	21.20
d	9,262	29	1,639	6,705	877	12	—	23.29
l	10,971	173	2,613	7,495	646	44	—	23.32
n	8,910	34	770	6,978	1,117	11	—	23.22
.. ..	6,194	20	455	4,785	927	7	—	27.85
.. ..	12,888	1,609	7,499	3,227	489	60	4	26.41
otal for the Kingdom ..	165,386	8,419	58,967	85,642	11,072	1,276	10	22.48

inus.

a) NUMBER OF DEATHS FROM TETANUS BY AGE-GROUPS 1903 TO 1922 (ACTUAL FIGURES AND DEATH RATE PER 100,000 INHABITANTS).

	Under 1 year		1-4 years		5-14 years		15-19 years		20-29 years		30-39 years	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
7	83	45	9	8	21	3	12	2	15	3	19	6
2	86	54	11	4	19	6	23	1	20	6	17	4
7	59	43	12	6	19	5	18	2	21	6	21	7
2	25	16	10	3	21	9	19	3	24	7	19	6
otal ..	253	158	42	21	80	23	72	8	80	22	76	23
	411		63		103		80		102		99	
per year	20.5		3.2		5.2		4		5.1		5	

a) NUMBER OF DEATHS FROM TETANUS BY AGE-GROUPS, 1903 TO 1922 TUAL FIGURES AND DEATH RATE PER 100,000 INHABITANTS) *(continued)*.

	40-49 years		50-59 years		60 and over		Totals			Rate per 100,000 inhabitants		
	M.	F.	M.	F.	M.	F.	M.	F.	T.	Male	Female	Both Sexes
7	17	4	19	5	5	4	200	80	280	7.27	2.86	5.05
2	19	2	18	7	5	2	218	86	304	7.47	2.88	5.50
7	10	4	18	9	13	3	191	86	277	6.00	2.67	4.33
2	18	1	19	1	15	3	170	51	221	4.99	1.18	3.22
otal ..	64	11	74	24	38	12	779	303	1,082	6.48	2.55	4.46
	75		98		50		1,082					
per year	3.7		4.9		2.5		54.1					

According to information supplied to Professor Aldershoff by specialists i cology, omphalitis showing the presence of tetanus bacilli seems to be muc prevalent than is generally supposed. In the agricultural provinces of Gro Zeeland and Limburg, the figures for the period 1907-13 were high, but decrease was registered for the period 1914-23 as a result of the introduc agricultural machinery and the substitution of artificial for natural manur

The figures for communes with less than 5,000 inhabitants are three times as those for the larger towns.

(b) NUMBER OF DEATHS FROM TETANUS BY AGE-GROUPS IN CERTAIN CENTRES OF VARYING IMPORTANCE, 1903-23.

	Under 14 years		15-19 years		30-49 years		50 and over		Total	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
1909–1913	13	8	6	2	4	—	3	2	26	12
Over 100,000 inhab. 1914–1923	12	7	7	2	7	5	4	—	30	14
1909–1913	12	13	6	—	11	1	2	3	31	17
20,000 - 100,000 inh. 1914–1923	21	11	7	1	4	2	12	2	44	16
1909–1913	46	20	20	1	7	1	6	3	79	24
5,000 - 20,000 inh. 1914-1923	54	30	28	13	22	9	25	10	129	62
1909–1913	45	24	20	1	16	6	12	4	93	35
Under 5,000 inh. 1914–1923	47	29	32	5	29	1	26	6	134	41
1909–1913	116	65	52	4	38	7	23	12	229	88
Total for the Kingdom 1914–1923	134	77	74	21	62	17	67	18	337	133

4. *Dysentery.*

In July, August and September 1925, there was an epidemic of dysen Staphorste, a district in which the population has only very elementary no hygiene. The spread of the disease was prevented by stringent measures ado the Department of Public Health. After a visit from the Medical Officer of of the Army, the Ministry of War also ordered the application of all necessary m to prevent the spread of the disease in the army.

5. *Post-vaccinal Encephalitis.*

As in 1924, a certain number of cases of post-vaccinal encephalitis were re in 1925. Dr. van Bouwdijk Bastiaanse was the first to draw attention to the ex of this disease in the Netherlands. He submitted the results of his investigatio Department of Public Health. He was then instructed, together with Dr. Te the Inspector-General of Public Health, and Dr. Bijl, the head of the Bacteri Section of the Central Public Health Laboratory, to undertake an exhaustive e the results of which were discussed at the Conference held early in January

ague, under the chairmanship of Professor Ricardo Jorge. On the advice van Bouwdijk Bastiaanse, the English methods were adopted in 1926, and or Aldershoff, M.D., Director of the State Serological Institute, prepared a or use in cases of post-vaccinal encephalitis.

V. PREVENTIVE MEDICINE AND HYGIENE

ld Welfare.

e Department for Child Welfare and the Campaign against Tuberculosis have d the number of child welfare centres in 1925, and brought the various ations dealing with that work into closer touch. With the co-operation of sts and medical practitioners, it also established centres of consultation ing the treatment of babies.

e results obtained in provinces which provided large subsidies for the work cially interesting.

e State subsidy is still small : 27,500 florins annually.

akly children are placed in holiday colonies or families in the country.

iday colonies, established after the pattern of those organised by the Swiss an, Walter Bion, have received support from the Netherlands Teachers'

e Central Society for Convalescence and Holiday Colonies, founded in 1901, mprises 300 sections scattered throughout the country, and has established er of colonies.

arge number of smaller denominational or local organisations have also been ied for the same purpose, and several have their own holiday colonies.

1925, the Central Society sent 3,916 children between the ages of 6 and 14 untry for a minimum period of five weeks, representing a total of 170,314 days.

1924, a society in Amsterdam sent 2,369 children (98,836 days) to holiday for a minimum period of six weeks, this figure, however, represents only children thus cared for by all the societies in Amsterdam during 1924.

925, the State grant covered the expenses of 433,092 days' stay in the country.

system of placing children in families in the country, which was inaugurated ars ago, has only become general since the war. In 1918, a central commis- establishing Dutch children in the country was created. This commission itself chiefly with children from the large towns between the ages of 8 and 15. it placed 3,305 children (185,760 days) in families for a minimum period of s, and sent 382 children (15,772 days) to a camp it had organised at Didam ren suffering from complaints which made it impossible to place them in

rapid development of these institutions pointed to the necessity for central tion. Consequently, certain communes appointed boards for placing children untry, on which the various local societies were represented. In 1923, the ent for Child Welfare suggested the creation of a Central Board on which ous societies and organisations throughout the country are represented.

ommission of the Health Council, which was called upon to fix conditions n children could be admitted to holiday colonies or placed in families, decided candidates must be medically examined ; the examination must be made by ol doctor, or, failing such, by a specialist in children's diseases, or by the ho usually attends the family.

2. *Housing* [1].

As in the four proceding years, many buildings were erected in 1925: 47,19 have been completed ; 28,299 were still in course of construction on Decemb 1925. Of these, 17,067 (62.2 per cent) are being built in the four large towns cent of the population). The figure for the remaining parts of the Kingd 11,232 (39.8 per cent).

NEW DWELLING-HOUSES.

Built by	1925	Per cent
The State, Provinces, Districts (Water Administration) and Railways	41	0.1
Communes	4,059	8.6
Societies	8,538	18.1
Private persons	34,553	73.2
Total	47,191	100

On April 1st, 1925, 16,056 dwelling-houses were being built *without* as from the authorities, and 14,806 *with* their assistance. These comprised apartments, 21,000 of which were workmen's dwellings.

It may be stated that, on the whole, the housing crisis is at an end in the lands. In Amsterdam alone, 3,079 dwelling-houses were vacant on Decemb 1925. Many apartments, however, are inhabited by several families.

Although the wages of workers in the building industries still vary from double and three times the pre-war figure, the cost of building does not greatly the general index number, a fact which is accounted for by the price of m and modern methods of buildings.

Decisions declaring houses uninhabitable have only been taken in cases. In a large number of apartments, the period granted before evacuat to be prolonged on account of the difficulties experienced by the tenants dwellings in finding suitable quarters, without being obliged to spend a portionate amount of their earnings on rents.

The Inspector-General of Housing is of opinion that, in order to ensure th ing of a sufficient number of dwellings, the " law on rents " (law on housing sions, law on the termination of leases, law requiring unoccupied premises to should be repealed as soon as possible. These laws are a serious obstacle building of houses by private enterprise.

The cyclone of August 10th, 1925, clearly proved the advantages of soun ing regulations and their strict enforcement. Houses built during recen suffered least.

The reconstruction was carried out under the direction of building established by the provincial relief committees, and placed under the contro department dealing with the housing of workmen.

The annual report ot the Director-General of Public Health shows that end of 1925, the total amount spent on the construction of temporary dwelli 11,926,079.93 florins.

Nine-tenths of the net profits realised from the letting of temporary d built with the help of State subsidies must be refunded to the Treasury : 1,23 florins have already been refunded.

[1] Information taken from the annual report of the Inspector-General of this service.

ıter Supply.

the end of 1925, 95 communes in *North Brabant* were connected with the main system (the full number of communes which should be connected is over 100). ıter-supply system is operated entirely by the provinces, and carries the water t to the consumer. Communes, must, however, insist on all dwellings 40 meters from a water-main being connected up with the system.

the province of *South Holland*, various systems of water supply are now work- The National Bureau for Water Supply has continued its propaganda in favour installation of a water supply in Flanders in *Zeeland*. This scheme provides connection of 35 communes in that district with one water-supply system. end of 1925, 19 communes comprising approximately 70 per cent of the ants of Flanders in Zeeland had approved of the scheme. The same situation with regard to the water supply in the districts of Schouwen and Duiveland ımunes). At the end of 1925, 16 communes had approved the scheme.

eadministrative authorities in *North Brabant* have drawn up regulations for ovince concerning the water supply. They provide for the control of the con- n and working of the water-supply systems to ensure satisfactory supplies ıout the province. A water-supply system has already been constructed in *imburg* ; 18 communes, some of which lie in the mining district, are connected : 3,000,000 florins are required for the installation of the system. The State province have consented to afford guarantees against risks,

the provinces of *Utrecht* and *Friesland*, various water-supply systems are now g, and plans have been drawn for the province of *Groningen*. Propaganda is ıade in favour of a system for *North Overyssel*. The system, when completed, pply 23 communes.

addition to the National Bureau for Water Supply, there is also a central water- commission in the Netherlands, which has advised the Government on various ıs, and has, with the Public Health Council, carried out the enquiry into the ı of goitre.

VI. CURATIVE MEDICINE.

ımber of Physicians, Dentists, Midwives and Pharmacists in 1925 (according to list of the Health Council).

Provinces	Physicians		Dentists		Midwives	Pharmacists		Assistant Pharmacists
	M.	F.	M.	F.		M.	F.	
rabant	257	6	25	3	77	26	3	81
nd	406	14	47	10	116	46	8	146
olland	1,096	49	150	21	221	142	47	587
olland	951	64	149	32	217	146	44	687
.. ..	110	3	9	1	27	11	3	40
.. ..	324	19	42	13	41	29	9	122
l	170	2	11	4	32	26	—	54
el	188	5	22	5	61	20	5	85
en	194	5	20	7	48	13	10	103
.. ..	70	1	5	—	30	10	1	26
.. ..	152	2	13	—	71	24	3	72
Total	3,918	170	493	96	941	493	133	2,003

2. *Hospitals.*

(a) HOSPITALS O

Provinces	General Hospitals		Children's Hospitals		Eye Hospitals		Totals	
	Hospitals	Beds	Hospitals	Beds	Hospitals	Beds	Hospitals	
Groningen	3	665	1	60	1	50	5	
Friesland	9	501	1	47	—	—	10	
Drenthe	4	146	—	—	—	—	4	
Overyssel	18	1,111	—	—	—	—	18	1,
Gelderland	36	1,857	2	118	2	39	40	2,
Utrecht	13	1,218	—	—	1	48	14	1,
North Holland	42	6,425	1	109	—	—	43	6,
South Holland	37	5,220	6	257	3	114	46	5,
Zeeland	12	431	—	—	—	—	12	
North Brabant	54	2,613	—	—	—	—	54	2,
Limburg	14	1,355	1	10	—	—	15	1,
Kingdom of the Netherlands, 1924	242	21,542	12	601	7	251	261	22,
Kingdom of the Netherlands, 1923	239	20,464	12	590	7	241	258	21,
Kingdom of the Netherlands, 1922	242	20,140	12	566	7	221	261	20,

(b) LUNATIC ASYLUMS AND PSYCHIATRICAL CLINI

Years	Number of patients on January 1st			Admittances			Pronounced sa		
	Males	Females	Total	Males	Females	Total	Males	Fem.	T
1924	8,854	8,926	17,780	1,780	2,125	3,905	6	6	
1925	9,167	9,247	18,414	1,866	2,139	4,005	19	8	
1924	377	305	682	(36) 156	(37) 268	(73) 424	1	4	
1925	397	344	741	(38) 196	(40) 312	(78) 508	4	4	

[1] Serves also as provincial and communal hospital.

JANUARY 1ST, 1925.

te Hospitals		Communal Hospitals		Private Hospitals		Beds per 1,000 inhabitants	Hospitals with more than 100 beds	Hospitals with 50 to 100 Beds	Hospitals with under 50 Beds
	Beds	Hospitals	Beds	Hospitals	Beds				
	550	—	—	4	225	2.0	1	3	1
	—	2	70	8	478	1.4	1	3	6
	—	1	6	3	140	0.7	—	1	3
	—	2	204	16	907	2.4	3	7	8
	—	2	282	38	1,732	2.6	5	11	24
	305	2	332	10	629	3.4	4	2	8
	—	11	3,506	32	3,028	4.8	13	15	15
	296	10	2,815	35	2,480	3.2	17	9	20
	—	2	72	10	359	1.7	1	2	9
	—	2	61	52	2,552	3.3	7	11	36
	—	2	112	13	1,253	2.8	4	2	9
	1,151	36	7,460	221	13,783	3.1	56	66	139
	1,151	33	6,883	221	13,261	3.0	51	64	143
	1,133	36	7,352	221	12,442	3.0	53	54	154

HITTANCES AND DISCHARGES OF PATIENTS IN 1925.

1925											
Discharged from Asylum						Deceased			Remaining on December 31st		
Cured			Uncured								
s	Females	Total	Males	Females	Total	Males	Fem.	Total	Males	Fem.	Total
	746	1,255	320	462	782	632	590	1,222	9,167	9,247	18,414
	735	1,266	352	459	811	655	595	1,250	9,476	9,589	19,065
	90	146	(55)35	(61) 83	(116) 118	25	28	53	397	344	741
	114	165	(90)47	(90) 108	(180) 155	33	27	60	406	353	759

The number of " open sections " (*cf.* page 285 of the *Health Year-Book* for which receive both persons of unsound mind and persons suffering from n affections has been increased by the opening of the Rest Cure Sana (Apeldoorn) belonging to the Central Israelite Union Lunatic Asylum i Netherlands.

The treatment of these patients by giving them work to do, which is of great not only from the medical but also from the social point of view, is deserving of attention. The Central Union for the Protection of Persons suffering from N and Mental Affections opened a score of consulting-rooms for nervous and diseases in 1925. Visiting and other nurses are attached to the dispensaries.

Courses on the home treatment of persons suffering from mental disease been organised for nurses attached to the Medical Relief Services.

BIBLIOGRAPHY.

Statistical Data : Publications of the Central Statistical Bureau (Dire Professor W. H. Methoorst, M.D.) at The Hague.

Legislation : Legal Gazette and *Acts of the States-General.* " Medical Ju dence ", by M. L. Lietaert-Peerbolte, *Medical Guide*, 1925, page 152.

Health Organisation : Dr. N. M. Josephus Jitta : *Organisation of the Public Services in the Kingdom of the Netherlands.*

" Health Organisation in the Netherlands, 1924. "

Report of the Commission for the Simplification and Amalgamation of the Medical Services (Report of the Sikkel Commission).

State Housing Department : Annual Report of the Director-General of Public H Annual Report of the Inspector-General of Housing.

Water Supply : Annual Report of the Director of the Central Water-S Bureau (see *Reports and Communications concerning Public Health*, No. 7, 192

Child Welfare : Report of the Commission for the Care of Children (see *R and Communications concerning Public Health*, No. 6, 1926).

Campaign against Tuberculosis : Annual Report of the Inspectorate of Welfare and the Anti-Tuberculosis Campaign (see *Reports and Communi concerning Public Health*).

Tegen de Tuberculose, review published by the Central Netherlands Anti- culosis League at The Hague.

Series of Articles : On sanocrysine, appearing in the *Netherlands Medical* and the *Medical Guide.*

" B. C. G. Vaccine and State Veterinary Inspection ", by J. A. Putto, *M Guide*, January 8th, 1926, 4th year, Part. 2.

Campaign against Venereal Diseases : Sexual Hygiene, review published by Veldhuyzen, Head of the Public Health Service in Amsterdam.

Campaign against Malaria : " The Anti-Malarial Campaign in North Holl by Dr. J. J. Th. Doyer, *Medical Guide*, 1925, page 63.

Mental Hygiene : Lunatic Asylums and Psychiatrical Institutions in H by Dr. J. H. Schuurmans-Stekhoven, *Medical Guide*, March 19th, 1926.

'urative Medicine : Annual Report of the Inspector-General of Infectious Diseases, see *Reports and Communications concerning Public Health*).

Jeneral Information : Annual Report of the Public Health Council (see *Reports Communications concerning Public Health*).

' Rats and ' Ratin ' ", by J. PEETERS and H. S. FRENKEL, *Medical Guide*.

rticles by Dr. VAN BOUWDIJK-BASTIAANSE in the *Netherlands Medical Review*, (January 3rd and March 14th), and in the *Medical Guide*.

' Serum Treatment of Post-vaccinal Encephalitis ", articles by Dr. VAN DIJK-BASTIAANSE and Professor ALDERSHOFF, M.D., in the *Netherlands Medical w*, and by Professor ALDERSHOFF, M.D., in the *Medical Guide*, 1926.

' Notes on Deaths caused by Tetanus ", by Professor H. ALDERSHOFF, M.D., *al Guide*, 1925, page 249.

' Preliminary Draft Law concerning Diseases and Accidents, 1925 ", by Dr. I. J. NG, *Medical Guide*, 1925.

' Le placement des enfants débiles dans des colonies et dans des familles ", M. Josephus JITTA, M.D. (*Bulletin de l'Office international d'hygiène publique*, re 1926*)*.

ugust 1926.

NORWAY

BY

H. M. GRAM (Oslo)

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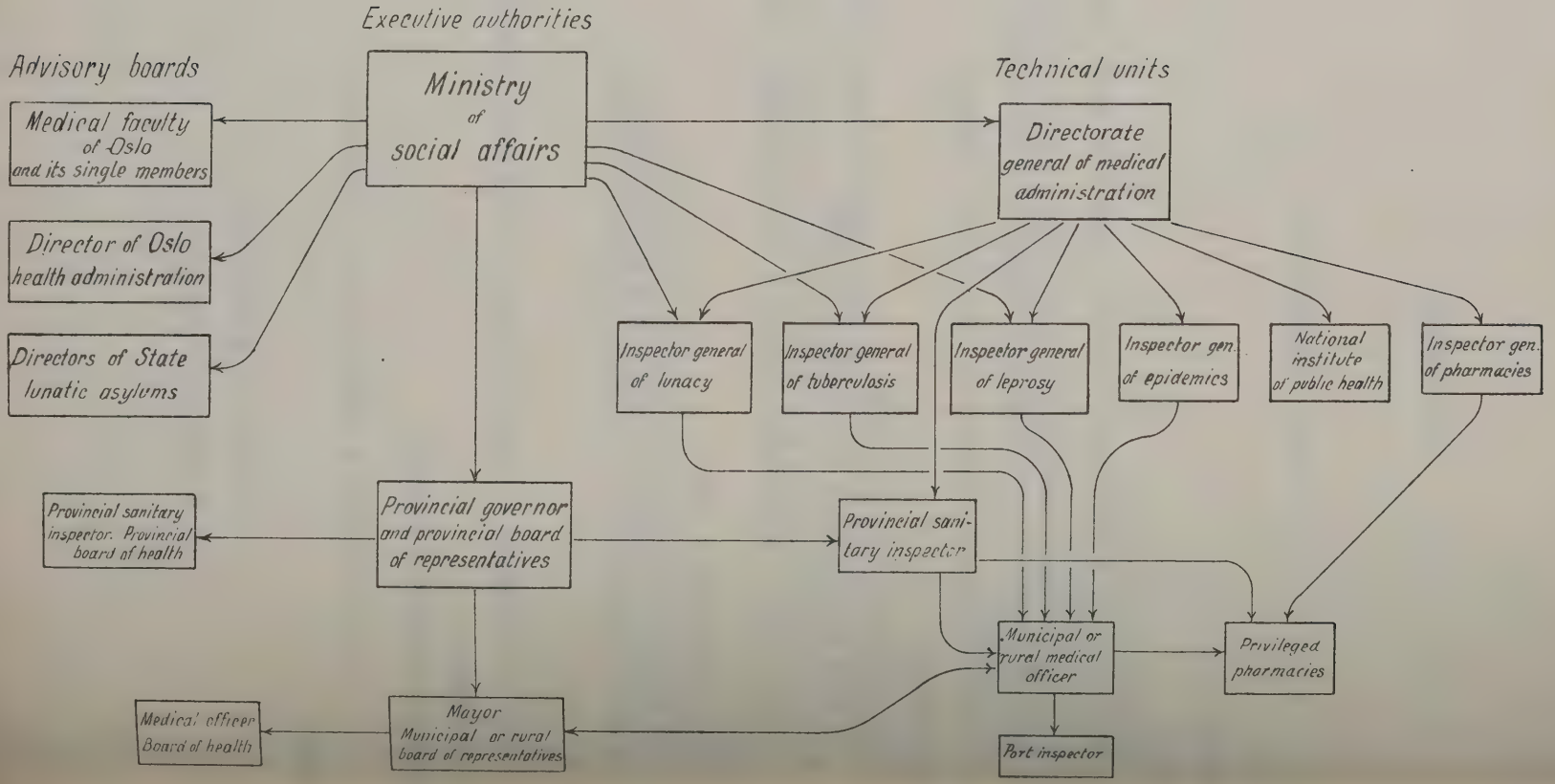
Public Health Organisation of Norway.


Executive authorities
Advisory boards
Technical units
Ministry of social affairs
Medical faculty of Oslo and its single members
Director of Oslo health administration
Directors of State lunatic asylums
Directorate general of medical administration
Inspector general of lunacy
Inspector general of tuberculosis
Inspector general of leprosy
Inspector gen. of epidemics
National institute of public health
Inspector gen. of pharmacies
Provincial sanitary inspector. Provincial board of health
Provincial governor and provincial board of representatives
Provincial sanitary inspector
Municipal or rural medical officer
Privileged pharmacies
Medical officer Board of health
Mayor Municipal or rural board of representatives
Port inspector

I. GENERAL INTRODUCTION.

1.

ıe area of Norway is 323,793.3 square kilometers, of which 309,900.5 square ters are land, while 13,892.8 square kilometers are water.

ulation.

ıe estimated population for 1925 was 2,772,460. The population at last census was 2,649,775.

tality.

General Mortality 1925. — The general death rate per 1,000 inhabitants was

(b) *Table I.*

MORTALITY AND PROPORTIONAL MORTALITY FROM THE MAIN CAUSES OF DEATH, 1918-22[1].

auses of Death	Per 1,000 Deaths					Per 100,000 Inhab				
	1918	1919	1920	1921	1922	1918	1919	1920	1921	1922
.. ..	116.0	149.4	159.9	163.9	159.1	176.5	177.7	182.5	171.0	175.8
tic pneumonia	120.8	73.3	58.5	40.9	49.5	183.9	87.1	66.8	42.6	54.7
.. ..	187.7	56.6	12.2	2.0	18.2	285.6	67.4	13.9	2.1	20.1
, abscess, pyæmia, mia	8.9	12.8	10.7	9.1	9.2	13.6	15.2	12.2	9.5	10.2
sis (all forms)	132.2	163.5	185.2	191.3	185.0	201.1	194.5	211.4	199.5	204.4
ectious diseases	42.2	68.6	56.6	42.5	35.9	64.2	81.5	64.6	44.3	39.6
.. ..	5.2	7.7	8.4	9.7	9.3	7.9	9.2	9.6	10.1	10.3
ıronic diseases of the id nutrition	7.0	7.5	8.9	10.8	11.2	10.7	8.9	10.2	11.3	12.3
æmorrhage, embolism	43.9	57.4	62.2	65.9	65.0	66.9	68.3	71.0	68.6	71.8
seases of the nervous	29.0	35.6	37.3	39.0	39.1	44.2	42.3	42.6	40.7	43.2
ieart diseases	32.7	38.6	39.5	43.3	42.6	49.7	45.9	45.0	45.1	47.0
is	8.3	9.0	11.8	14.8	16.2	12.7	10.8	13.5	15.4	18.0
erosis	19.0	24.5	30.0	33.5	34.0	28.9	29.2	34.3	34.9	37.5
of the heart	16.4	21.5	24.3	26.1	25.9	24.9	25.6	27.7	27.2	28.6
nd chronic bronchitis, broncho-pneumonia, natory pneumonia ..	51.1	58.7	59.7	58.9	61.1	77.8	69.8	68.2	61.4	67.5
.. ..	3.8	4.4	4.2	3.4	3.7	5.7	5.2	4.7	3.5	4.1
eases of the respiratory	3.3	4.0	3.4	3.9	3.9	5.0	4.8	3.9	4.1	4.3
of the digestive tract ..	31.2	36.1	34.3	38.3	36.0	47.5	43.0	39.1	39.9	39.8
l chronic nephritis ..	19.9	22.9	24.3	24.1	22.8	30.3	27.2	27.8	25.1	25.2
.. ..	65.7	88.6	92.7	101.4	100.2	100.0	105.4	105.8	105.8	110.7
eases	55.7	59.3	75.9	77.2	72.1	84.8	70.6	86.6	80.6	79.7
.. ..	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,521.9	1,189.6	1,141.4	1,042.7	1,104.8

[1] table showing the number of cases and deaths from notifiable infectious diseases is to be found in *Epidemiological Intelligence*, No. 10, p. 135.

(c) *Table II.*

GEOGRAPHICAL DISTRIBUTION OF THE MAIN CAUSES OF DEATH IN 1922
(Per 100,000 Inhabitants.)

Causes of Deaths	King-dom	Rural Districts	Cities	Oslo	Bergen	Trondh-jem	Stavan-ger	Dram-men
Senility	175.8	206.2	104.2	76.6	110.4	105.3	117.6	106.4
Diphtheritic pneumonia	54.7	56.7	50.1	40.0	45.8	38.6	52.0	68.4
Influenza	20.1	17.4	26.5	38.1	23.9	1.8	15.8	7.6
Erysipelas, abscess, pyæmia, septicæmia	10.2	9.8	11.2	12.4	10.4	10.5	6.8	11.4
Tuberculosis (all forms)	204.4	206.4	199.6	190.0	177.0	263.3	205.9	201.3
Other infectious diseases	39.6	36.2	47.7	48.6	57.3	50.9	79.2	79.8
Diabetes	10.3	9.2	12.7	12.8	7.3	19.3	15.8	7.6
Chronic diseases of the blood and nutrition	12.3	11.3	14.8	18.7	11.5	10.5	4.5	22.8
Cerebral hæmorrhage, embolism	71.8	66.9	83.3	68.8	80.2	101.8	86.0	129.2
Other diseases of the nervous system	43.2	41.2	48.0	50.1	50.0	35.1	27.1	34.2
Organic heart diseases	47.0	45.0	51.8	76.2	18.7	72.0	20.4	38.0
Myocarditis	18.0	15.9	22.7	11.7	79.1	3.5	20.4	11.4
Arteriosclerosis	37.5	33.4	47.1	50.1	42.7	42.1	33.9	76.0
Paralysis of the heart	28.6	25.7	35.4	35.0	38.5	26.3	65.6	45.6
Acute and chronic bronchitis, asthma, broncho-pneumonia, inflammatory pneumonia	67.5	62.1	80.5	93.3	53.1	75.5	67.9	60.8
Pleurisy	4.1	4.0	4.2	5.4	6.2	5.3	2.3	7.6
Other diseases of the respiratory tract	4.3	3.7	5.9	6.2	5.2	—	2.3	3.8
Diseases of the digestive tract	39.8	39.6	40.2	45.5	47.9	29.8	20.4	15.2
Acute and chronic nephritis	25.2	22.5	31.6	34.6	34.4	29.8	22.6	11.4
Cancer	110.7	104.5	125.4	135.2	128.1	108.8	144.8	125.4
Other diseases	79.7	72.9	95.6	134.5	66.6	75.5	67.9	110.2
Total	1,104.8	1,090.6	1,138.5	1,183.8	1,094.3	1,105.7	1,079.2	1,174.1

(d) *Table III.*

RATES OF MORTALITY PER 10,000 INHABITANTS BY AGE GROUPS AND SEX, 1841-1920.

roups	Number of Deaths per 10,000 Inhabitants							
	1841-50	1851-60	1861-70	1871-80	1881-90	1891-1900	1901-10	1911-20
les								
.. ..	1,305	1,215	1,230	1,222	1,131	1,137	864	738
.. ..	315	265	339	292	296	216	137	113
.. ..	145	130	174	137	152	92	59	51
.. ..	67	60	80	65	76	50	36	34
.. ..	286	267	288	255	254	211	149	128
.. ..	47	46	52	(51) 40 / 63	(56) 46 / 67	(54) 37 / 73	(47) 30 / 63	(46) 28 / 64
.. ..	81	84	89	(92) 93 / 90	(93) 96 / 88	(101) 107 / 95	(88) 92 / 82	(95) 97 / 92
.. ..	92	87	85	86	81	86	75	80
.. ..	135	120	113	108	99	101	90	89
.. ..	215	185	183	169	157	155	141	142
.. ..	395	360	358	335	309	298	283	285
.. ..	875	810	808	745	707	681	649	670
.. ..	1,745	1,785	1,794	1,632	1,641	1,641	1,556	1,607
.. ..	2,980	3,205	3,543	3,018	3,271	3,204	3,200	3,195
ales								
.. ..	1,055	1,015	1,036	1,021	955	924	700	593
.. ..	295	260	326	281	287	201	130	104
.. ..	150	125	173	132	152	90	55	46
.. ..	66	59	82	65	79	52	36	32
.. ..	250	232	262	229	234	184	129	108
.. ..	43	42	48	(47) 42 / 51	(52) 50 / 55	(49) 42 / 56	(45) 36 / 53	(44) 33 / 55
.. ..	59	60	64	(67) 63 / 72	(69) 64 / 74	(67) 62 / 73	(66) 64 / 68	(72) 70 / 71
.. ..	85	87	83	85	85	80	77	71
.. ..	111	106	99	98	94	89	82	80
.. ..	165	150	147	142	132	124	120	115
.. ..	350	310	314	291	269	252	239	238
.. ..	790	760	724	670	617	613	587	592
.. ..	1,720	1,645	1,608	1,507	1,504	1,475	1,423	1,455
.. ..	3,335	2,935	3,481	2,823	3,070	2,955	2,952	2,950

(e) *Table IV.*

NUMBER OF DEATHS ACCORDING TO AGE AND SEX, 1921-22.

Age at Death	Deaths among the Resident Population				Deaths amo Present Mal lation
	Males		Females		
	1921	1922	1921	1922	1921
Years 0	1,379	1,367	1,058	1,048	1,379
1	809	771	600	631	809
2	201	248	162	243	200
3	139	132	92	99	139
4	102	95	102	77	101
5– 9	340	325	292	293	340
10– 14	272	291	306	297	271
15– 19	554	559	584	587	539
20– 24	847	891	719	750	807
25– 29	643	728	594	588	607
30– 34	491	541	493	519	463
35– 39	400	436	460	466	376
40– 44	417	420	443	453	395
45– 49	476	538	481	483	468
50– 54	531	521	529	559	524
55– 59	683	651	616	717	675
60– 64	849	893	825	886	843
65– 69	1,111	1,120	1,043	1,219	1,111
70– 74	1,243	1,375	1,278	1,472	1,241
75– 79	1,380	1,443	1,456	1,660	1,381
80– 84	1,118	1,305	1,363	1,510	1,118
85– 89	913	872	1,097	1,176	913
90– 94	385	391	497	538	385
95– 99	91	80	149	154	91
100–104	12	13	17	22	12
105–109	0	0	1	0	0
Unknown	33	22	17	9	15

4. *Infant Mortality.*

(a) *General Rate of Infant Mortality.* — The death rate per 1,000 livi children below one year has not been estimated for 1925 and 1924. In 192 49.02.

(b) *Table V.*

ITY AT AGE 0-1 YEAR FROM THE MAIN CAUSES OF DEATH ACCORDING TO THEIR GEOGRAPHICAL DISTRIBUTION IN 1922.

(Per 1,000 Live-births.)

es of Death	Kingdom	Rural Districts	Cities	Oslo	Bergen	Trondhjem	Stavanger
l debility and							
nation	17.9	16.1	23.3	35.7	11.7	16.8	19.4
and enteritis ..	3.2	2.5	5.3	4.7	2.6	6.1	8.1
pneumonia ..	2.6	2.2	3.8	2.7	3.7	5.3	6.1
sis	1.6	1.4	2.2	2.0	1.0	3.1	1.0
ctious diseases ..	4.3	3.3	7.6	11.8	7.4	6.9	8.1
.. .. ..	0.5	0.4	0.7	0.7	0.5	0.8	—
ve meningitis ..	0.5	0.4	0.8	1.0	1.0	0.8	—
s in infants ..	4.8	4.6	5.5	3.2	5.3	3.8	5.1
f the respiratory							
.. .. ..	7.9	6.7	11.6	11.8	11.0	9.9	12.2
ases	2.4	2.2	2.8	2.7	1.1	—	2.0
.. .. ..	45.7	39.8	63.6	76.3	45.3	53.5	62.0

(c) *Table VI.*

RTION OF STILL-BIRTHS ACCORDING TO SEX AND LEGITIMACY, 1901-22.

	Legitimate Infants	Illegitimate Infants	Males	Females	Total	Still-births per 1,000 Total Births				
						Males	Females	Total	Legitimate Infants	Illegitimate Infants
.	1,514	205	969	750	1,719	27.4	22.7	25.1	23.9	41.0
.	1,394	202	908	688	1,596	26.1	21.1	23.6	22.2	40,8
.	1,467	167	863	771	1,634	25.3	23.8	24.6	23.8	34,5
.	1,388	191	892	687	1,579	26.6	21.8	24.2	22.9	41.9
.	1,282	179	823	638	1,461	25.2	20.7	23.0	21.7	40.9
.	1,304	130	809	625	1,434	24.9	20.5	22.8	22.2	30.4
.	1,270	142	779	633	1,412	24.4	20.9	22.7	21.9	33.3
.	1,288	143	812	619	1,431	25.1	20.5	22.9	22.1	33.1
.	1,297	156	786	667	1,453	23.7	21.5	22.7	21.7	36.3
.	1,263	142	763	642	1,405	23.8	21.0	25.5	21.6	33.9
.	1,250	159	791	618	1,409	24.5	20.4	22.5	21.4	37.1
.	1,262	160	810	612	1,422	24.8	19.9	22.4	21.4	36.7
.	1,203	161	728	636	1.364	22.5	20.8	21.6	20.6	35.2
.	1,199	171	768	602	1,370	23.3	19.6	21.5	20.3	36.6
.	1,230	157	801	586	1.387	26.1	20.0	23.2	22.1	36.9
.	1,218	151	770	599	1,369	24.0	19.7	21.9	21.0	33.2
.	1,315	137	810	642	1,452	24.1	20.2	22.2	21.6	29.8
.	1,340	173	850	663	1,513	25.5	21.1	23.3	22.2	39.4
.	1,257	130	751	636	1,387	23.9	22.0	23.0	22.3	42.5
.	1,251	178	788	641	1,429	21.8	18.8	20.3	19.3	33.1
.	1,047	124	669	502	1,171	20.0	15.8	17.7	17.4	25.1
.	1,150	161	732	579	1,311	22.5	18.6	20.6	19.4	36.2

(d) *Table VII.*

MORTALITY AND PROPORTIONAL MORTALITY AMONG INFANTS (0-1 YEAR), 1

Causes of Death	Per 1,000 Deaths					Per 1,000 Live-birth			
	1918	1919	1920	1921	1922	1918	1919	1920	192
Congenital debility and malformations	392.6	369.9	390.6	404.8	390.8	19.4	16.8	17.5	17.
Diarrhœa and enteritis	72.1	73.9	65.9	70.7	70.0	3.6	3.4	2.9	3.
Diphtheric pneumonia	70.8	58.2	65.9	56.2	56.4	3.5	2.6	2.9	2.
Tuberculosis	24.0	39.9	34.4	33.4	35.4	1.2	1.8	1.5	1.
Other infectious diseases	161.2	115.0	110.7	80.5	95.2	7.9	5.2	5.0	3.
Rickets	4.8	7.1	7.8	13.1	10.5	0.2	0.3	0.4	0.
Suppurative meningitis	11.9	19.4	11.0	11.2	10.8	0.6	0.9	0.5	0.
Convulsions in infants	97.5	95.2	96.4	104.5	105.4	4.8	4.3	4.3	4.
Diseases of the respiratory tract	125.7	169.5	133.8	170.8	174.0	6.2	7.7	6.0	7.
Other diseases	39.4	51.9	83.5	54.8	51.5	1.9	2.4	3.7	2.
Total	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	49.3	45.4	44.7	43.

5. *Birth Rate.*

(a) *General Birth Rate*, 1925. — The birth rate in 1925 was 20 per 1,00

(b) *Table VIII.*

BIRTHS ACCORDING TO SEX AND LEGITIMACY, 1901-22.

Year	Live-Births			Among which Illegitimate	Number of Illegitimate Infants per 100 Still-births	Still-births	Among which Illegitimate	Multiple Bir	
	Males	Females	Total					Twin Births	Triple Births
1901	34.360	32.359	66.719	4.794	7,19	1.719	205	938	8
1902	33.934	31.982	65.916	4.753	7.21	1.596	202	859	7
1903	33.276	31.625	64.901	4.668	7,19	1.634	167	891	3
1904	32.689	30.897	63.586	4.370	6,87	1.579	191	858	8
1905	31.809	30.248	62.057	4.207	6,78	1.461	179	849	9
1906	31.683	29.870	61.553	4.145	6,73	1.434	130	859	16
1907	31.179	29.590	60.769	4.126	6,79	1.412	142	835	10
1908	31.607	29.544	61.151	4.173	6,82	1.431	143	837	5
1909	32.235	30.344	62.579	4.144	6,62	1.453	156	856	13
1910	31.272	29.875	61.147	4.041	6,61	1.405	142	837	6
1911	31.454	29.697	61.151	4.125	6,75	1.409	159	856	14
1912	31.851	30.086	61.937	4.202	6,78	1.422	160	906	9
1913	31.677	29.988	61.665	4.413	7,16	1.364	161	843	9
1914	32.168	30.055	62.223	4.503	7,24	1.370	171	790	14
1915	29.884	28.656	58.540	4.094	6,99	1.387	157	861	8
1916	31.361	29.747	61.108	4.399	7,20	1.369	151	858	13
1917	32.804	31.111	63.915	4.466	6,99	1.452	137	972	5
1918	32.506	30.820	63.326	4.222	6,67	1.513	173	886	10
1919	30.703	28.310	59.013	3.827	6,49	1.387	130	879	11
1920	35.383	33.498	68.881	5.206	7.56	1.429	178	1.000	19
1921	32.752	31.269	64.021	4.822	7,53	1.171	124	958	5
1922	31.862	30.599	62.461	4.288	6,87	1.311	161	922	8

(c) *Table IX.*

GEOGRAPHICAL DISTRIBUTION OF BIRTHS AND DEATHS IN 1922.

refectures	Live-births		Still-births		Deaths	Deaths at age 0-1 year	Infant Mortality (per 1,000 Births)
		among which Illegitimate		among which Illegitimate			
.. .. ..	3,775	265	66	5	1,832	215	57.0
.. .. ..	4,637	342	108	21	1,855	241	52.0
.. .. ..	4,063	466	65	19	3,234	282	69.4
.. .. ..	4,247	376	82	5	1,781	216	50.9
.. .. ..	3,359	222	66	8	1,564	145	43.2
.. .. ..	3,396	184	65	8	1,512	183	53.9
.. .. ..	2,823	140	57	7	1,495	183	64.8
.. .. ..	2,887	115	67	10	1,505	168	58.2
er	1,522	38	31	1	1,016	76	49.9
er	1,748	49	28	–	1,166	83	47.5
.. .. ..	4,225	135	88	8	1,942	219	51.8
.. ..	3,863	88	98	3	1,959	212	54.9
.. .. ..	1,899	141	27	5	1,103	92	48.4
'jorda ..	2,024	72	37	4	1,256	80	39.5
.. .. ..	3,774	215	77	9	1,975	143	37.9
elag	3,982	423	90	8	2,093	201	50.5
ıdelag	2,186	146	71	12	1,251	102	46.7
.. .. ..	4,458	485	103	15	2,052	244	54.7
.. .. ..	2,316	214	43	6	1,125	172	74.3
.. .. ..	1,277	172	42	7	757	170	133.1
istricts	46,874	2,941	1,013	107	22,732	2,417	51.6
.. .. ..	15,587	1,347	298	54	9,741	1,010	64.8
.. ..	62,461	4,288	1,311	161	32,484	3,427	54.7
:							
.. .. ..	2.31	6.87	2.06	12.28	1.20	5.49	—
.. .. ..	2.40	7.53	1.80	10.59	1.15	5.43	—
.. .. ..	2.61	7.56	2.03	12.46	1.28	5.79	—

(d) *Table X.*

MONTHLY DISTRIBUTION OF LIVE-BIRTHS AND DEATHS, 1916-20.

	January	February	March	April	May	June	July	August	Sept.	October	Nov.	Dec.	Unknown	Total
Live-births ..	27,196	25,229	28,374	27,965	28,058	26,262	26,053	25,448	27,748	25,631	23,425	25,923	57	317,369
Deaths ..	17,759	15,783	16,638	14,970	14,890	13,138	13,175	12,007	12,792	17,424	18,370	16,176	160	183,282
Death, 0-1 year	2,070	1,970	1,941	1,871	1,890	1,595	1,626	1,433	1,556	1,828	2,135	2,212	5	22,132
	Same Data for a Total of 12,000 Cases:													
Live-births ..	1,028.3	953.9	1,072.8	1,057.4	1,060.9	993.0	985.1	962.2	1,049.2	969.1	885.7	980.2	2.2	12,000
Deaths ..	1,162.7	1,033.4	1,089.3	980.1	974.9	860.2	862.6	786.1	837.5	1,140.8	1,202.8	1,059.1	10.5	12,000
Death, 0-1 year	1,122.4	1,068.1	1,052.4	1,014.5	1,024.8	864.8	881.6	777.0	843.7	991.1	1,157.6	1,199.3	2.7	12,000

Table XI.

SUMMARY OF THE MONTHLY EPIDEMIOLOGICAL REPORTS FROM THE RURAL DISTRICTS FOR 1925.

	January		February		March		April		May		June		July		August		Sept.		October.		Nov.		Dec.	
	Cases.	Deaths.	Cases.	Deaths	Cases.	Deaths.	Cases.	Deaths.	ases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Gonorrhœa	66	—	42	—	72	—	60	—	64	—	71	—	80	—	104	—	86	—	98	—	66	—	65	—
Soft chancre	2	—	4	—	—	—	2	—	—	—	—	—	4	—	1	—	2	—	4	—	3	—	3	—
Lues, acquired (newcases)	21	—	6	—	14	—	14	—	7	—	5	—	6	—	7	—	6	—	13	—	18	—	9	—
Lues, congenital ..	1	1	2	—	3	—	3	—	—	—	1	—	—	—	2	—	—	—	2	—	—	—	2	—
Typhoid fever, including paratyphus	17	1	15	1	16	1	22	1	8	—	45	—	27	—	63	—	61	—	31	2	10	1	14	—
Cerebro-spinal meningitis	7	5	4	1	2	2	1	—	—	—	1	—	3	1	2	2	5	2	1	—	3	2	4	—
Poliomyelitis, acute. ..	6	2	1	—	3	—	1	—	—	—	12	—	29	4	156	18	137	20	77	4	44	4	18	4
Scarlet fever	57	—	88	—	63	—	63	—	59	—	77	1	53	—	63	—	61	—	118	1	47	—	66	—
Measles	1,054	—	834	3	857	2	961	3	736	1	607	3	437	—	125	1	117	—	203	—	220	—	121	1
Diphtheria, including croup	50	5	54	—	42	1	53	3	50	2	49	3	43	3	93	1	51	4	38	4	52	3	59	3
Dysentery	—	—	—	—	—	—	5	—	—	—	—	—	4	—	136	7	62	—	37	1	61	1	57	—
Puerperal fever ..	17	4	11	3	23	3	19	2	9	2	13	2	5	1	10	3	12	3	13	1	10	—	10	1
Pemphigus neon.	1	1	3	—	3	—	3	—	2	—	6	1	3	—	4	—	1	—	1	—	2	—	7	—

orway, the fiscal year is from July 1st to June 30th of the following year. ssary therefore to give the last two budgets side by side in order to show receipts and expenditures for the calendar year 1925. The receipts and res will be arrived at by adding half of the first column to half of the second

rtunately for the easy comparison between the previous financial year the summing-up of the State budget has been presented in a different form ar 1925-26.

a " net budget " in which fictitious receipts have been eliminated instead counterbalanced in calculation, and the economic activities of the State entered with their net results instead of being calculated with their full f receipts and expenditures.

etails of the Health Budget, however, are not so much altered by this form ation.

igures are given in thousands of crowns.

	1924-25		1925-26	
	Receipts	Expenses	Receipts [1]	Expenses
yal Household	3	865		858
rliament and Public Audit ..	5	2,989		3,017
rsonnel of the Government and its Offices (with the exception of the Ministry for Foreign Affairs) and of Public Commissions	233	5,514		4,775
reign Affairs (Ministry, Legations, Consulates, etc. ..	346	4,339	350	4,334
urches, Clergy, etc.	6,277	6,735	1,485	2,677
iversity, Science, Letters and Arts	902	5,355	1,266	7,267
ondary Schools	1,507	5,438	1,514	5,384
mentary Schools	17,891	36,752		22,860
cial Schools	1,681	6,340	1,725	5,991
tice and Police	2,040	15,073	2,012	17,186
ial Organisations	213	14,923		15,966
dical Services	6,022	21,576	5,958	21,532
ts, Commerce, Industry, Fisheries and Mercantile Marine ..	72,280	83,799	1,548	15,102
riculture	5,086	17,910	2,092	14,626
mmunications and Public Works	105,325	113,199	3,151	15,612
ny and Navy	869	51,833	1,036	50,651
ance, Customs, Public Debt ervice, Extraordinary Receipts and Expenditure ..	385,637	190,777	400,836	204,676

[1] ems entered under receipts in previous budgets have been deducted from the expenses and do not present budget.

HEALTH BUDGET IN 1925.

The general principles of the Health Budget are mentioned in the Y
for 1924

Details of the Health Budget.

CHAPTER XI.

1. Inspection of industrial labour :	1924-25 Crow
Salaries of officials of the central office, inspectors and assistants	147,593
Office expenses	46,720
Travelling expenses	40,000
Central Labour Board	12,000
Inspection of domestic industries	8,900
	255,213
2. Grant to homes for assisted children	55,000
3. Grants to maternity homes	65,500
4. Grants to the Association for the Improvement of Housing	10,000
5. Grant to the campaign against drink	73,200
Total of health expenditure under Chapter XI	458,913

CHAPTER XII.

1. Anti-tubercular expenditure :	1924-25 Crow
A. State sanatoria and hospitals, expenses of upkeep	1,353,035
B. Grant for the building of a new sanatorium [1]	200,000
C. Grants to private sanatoria and hospitals	707,100
D. Grants to communes, associations, etc.	1,800,500
2. Maritime quarantine budget, etc.	34,550
3. Grants to sanatoria for inebriates	77,600
4. State laboratories for the Health Service, etc.	105,570
5. Salaries of medical officers of health	2,367,250
6. Travelling expenses of medical officers of health and extraordinary expenditure	766,000
7. Treatment of lepers	180,850
8. Contribution (two-fifths) towards salaries of midwives	445,000

[1] The new sanatorium near Oslo is ready, containing 180 sanatoria beds and 50 beds for convalescents and training for new and more suitable trades.

financial crisis has necessitated the most strict economy in the spending
available for public health purposes.
he other side, high prices and debts from the preceding year have made it
to grant rather high amounts specially for the upkeep of hospitals.
der to enable the State to finish the construction of a new Institute of Public
the Rockefeller Foundation granted 1,085,000 crowns. The institute is
to be ready in 1928.

ENT REFORMS IN HEALTH ADMINISTRATION AND LEGISLATION.

nd Decrees, 1925.

uary 20th (Addition to the Rules of January 27th, 1922, concerning Epidemic
. — Encephalitis lethargica, wherever found, even on ships lying in Norwegian
o be considered on a par with poliomyelitis, typhoid fever and other malignant
s diseases.

5th. Law concerning Alterations in the Tuberculosis Law of May 8th, 1900.
n 13 of the Tuberculosis Law is hereafter to be read as follows :
dents of boards of health and other doctors appointed by presidents of
health to carry on inspection work in their place are entitled to a refund
the common schedule of travelling expenses caused by this law. Refund
expenses are refunded by the State, travelling fares by the county or
lity in question.
n impecunious tuberculosis patients are treated in a hospital or boarded out
ome by decree of the board of health in order to avoid infection of others
ne expenses will be paid by the town (municipality or seaport with autonomous
ation) where the patients live ; so far as rural communities are concerned,
unty where the patient's domicile is situated.
community in question receives four-tenths of the expenses refunded by
if it sends in to the Ministry of Health verified statements and other
hat the Ministry may require. The Ministry can fix a maximum limitation
portion due from the State. To that end, accounts and other information
presented to the Ministry on demand.
county council is empowered to decree that up to half the expenses falling
unty may be paid by the special rural community where the patient lives.
fection expenses are to be paid by the town or the county. However,
private sanatoria which receive paying patients have to pay for disinfection.

5th. Law altering and supplementing the Law on Treatment of Lunatics of
7th, 1848. — Lunatic asylums may have a number of dependent small
mes where lunatics may be boarded and treated under the direct care and
the resident asylum doctors. (Under the old Law, the supervision had to
y the medical officer of the community or county.)
cunious lunatics whose mental condition requires a special kind of treat-
o be paid for according to analogous principles to those cited in § 13 of the
rculosis Law (see above).
toms caused by bodily illness, however grave and important, when not
do not allow lunatics to be handed over from the commune to the county
ite.

17th. Law concerning Alterations and Supplements to the Law of Sickness
of August 10th, 1915, *etc.* — Principal feature : Members are not — as

before — entitled to free treatment by doctor or midwife, but are only en refund of their own payment. The scale of reimbursement is to be fixed decree.

Instead of receiving these grants, patients may be given free treatm hospital.

In 1924, Norway ratified the Convention of October 16th, 1912, concern for chemical analysis. The ratification was published in January 1925.

In the course of 1925, Norway concluded a series of treaties with other concerning the reciprocal treatment in asylums or other hospitals.

2. *Epidemic and Infectious Diseases.*

The condition of epidemics is, on the whole, satisfactory.

Acute poliomyelitis and *bacillary dysentery* of the atoxic types appeared in a of distinct small epidemic outbreaks, chiefly in the latter half of the year, a more pronounced in rural districts than in towns. The summer was an unco long and hot one.

A summary of the monthly reports of rural districts is reproduced in Ta (Regarding the towns, the figures are printed for the whole year in the *Epidemiological Report* of the League of Nations, No. 2, February 15th, 1

Purpura epidemica (see *Tideskrift for den norske Lægeforening* 1924, p which appeared in 1924, disappeared in 1925, with the possible exception o doubtful cases. It has never shown malignant characteristics, and it disa completely when all acute cases had been isolated.

The disease seemed to be very contagious, had a short period of incubat attacked almost exclusively women and children. In some cases, the sy (purpura spots and rheumatoid pains) reappeared after weeks and months in t person, but the recidives did not seem to be infectious.

Careful bacteriological and pathological researches (tropsy of purpur included) gave no result as to the character or morphology of the infectious

III. PREVENTIVE MEDICINE AND HYGIENE.

Tuberculosis.

The new tuberculosis sanatorium near Oslo has opened a home for 50 tube convalescents. These are admitted for a year, coming partly from the sana partly from without.

They are taught a suitable trade under a trained specialist and are su to do most of the housework, beside their trade.

The products are sold. The workers' wages include the (very modest) payment; the surplus is paid to the worker, on leaving the home, and amounts during the stay in the home.

This is the first experiment in Norway in systematic training, and the aut are very much interested in its future.

IV. CURATIVE MEDICINE.

The organisation of hospitals and sick insurance funds was the same in 19 the preceding years.

No alterations have taken place in the teaching of medicine. In biology Chair of Biological Chemistry has been added. Biological chemistry was fo taught by the professor of physiology.

number of medical men at the beginning of the year was 1,513, including 51
Seventy three new doctors graduated and 42 retired. At the end of the year
re 1,544, including 50 abroad.
number of medical students was 850 at the beginning of the year.
ıe course of the year, 175 students started their studies and 73 finished them.
ıd of the year, the number therefore was 952.

V. GENERAL QUESTIONS.

ew feature is to be recorded as regards the control of foodstuffs, etc., and the
ɔpaganda.
ıealth of the mercantile marine has been taken up by the Norwegian Red Cross.
ɔreparation of a new manual of health and treatment of sickness aboard has
usted to a committee consisting partly of ships' doctors. The work is now
l has been submitted to the medical and maritime authorities.
her committee, composed of medical, pharmaceutical and maritime experts,
red a programme of new rules for the stock of drugs and healing requisites
ip.

1926.

POLAND

BY

Mrs. S. ADAMOWICZ (Warsaw)

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I. GENERAL INTRODUCTION.

: 388,328 square kilometers.

'ation.

›rding to the estimates of the Central Statistical Office, 1925 : 28,881,000.

ral Mortality, 1925.

ince or City	Population[1]	Total Deaths	Rate per 1,000
a (province)	935,679	15,925	14.67
Posen) (province)	1,967,649	28,872	17.02
rovince)	1,124,967	17,431	15.49
(city)[2]	992,450	13,968	14.10
y)	527,242	7,579	14.37
(city)	95,833	1,487	15.52
ity)	103,206	1,815	17.59
(city)	86,095	1,044	12.13
Posen) (city)	209,947	3,335	15.88
(city)	100,804	1,377	13.66
(city)	113,311	1,486	13.11
ity)	187,108	3,456	18.47
emberg) (city)	232,702	3,724	16.00

l Mortality. 1925.

ice or City	Total Births	Total Deaths under one year of age	Death Rate per 1,000 births
rovince)	63,472	9,422	148.44
ity)	6,465	1,043	161.33
(city)	3,198	471	147.28
(province)	33,466	5,660	169.13
y)	1,642	318	193.67
(city)	1,441	275	190.84
ovince)	39,000	6,511	166.95
(city)	3,127	478	152.86
Huta (city)	2,139	344	160.82

II. PUBLIC HEALTH ADMINISTRATION.

isation.

g the past year no change occurred in regard to the Health Administration ntry. The scheme of organisation is given in Tables Nos. 1, 2 and 3 386-387).

development was the creation of the Advisory Board of the Public Health ith the generous assistance of the Rockefeller Foundation. The duties

[1] *Statistical Year-Book of the Polish Republic* for 1924.
[2] *Statistical Year-Book of the City of Warsaw* for 1923 and 1924.

Table No. 1.

ADMINISTRATIVE DIVISIONS.

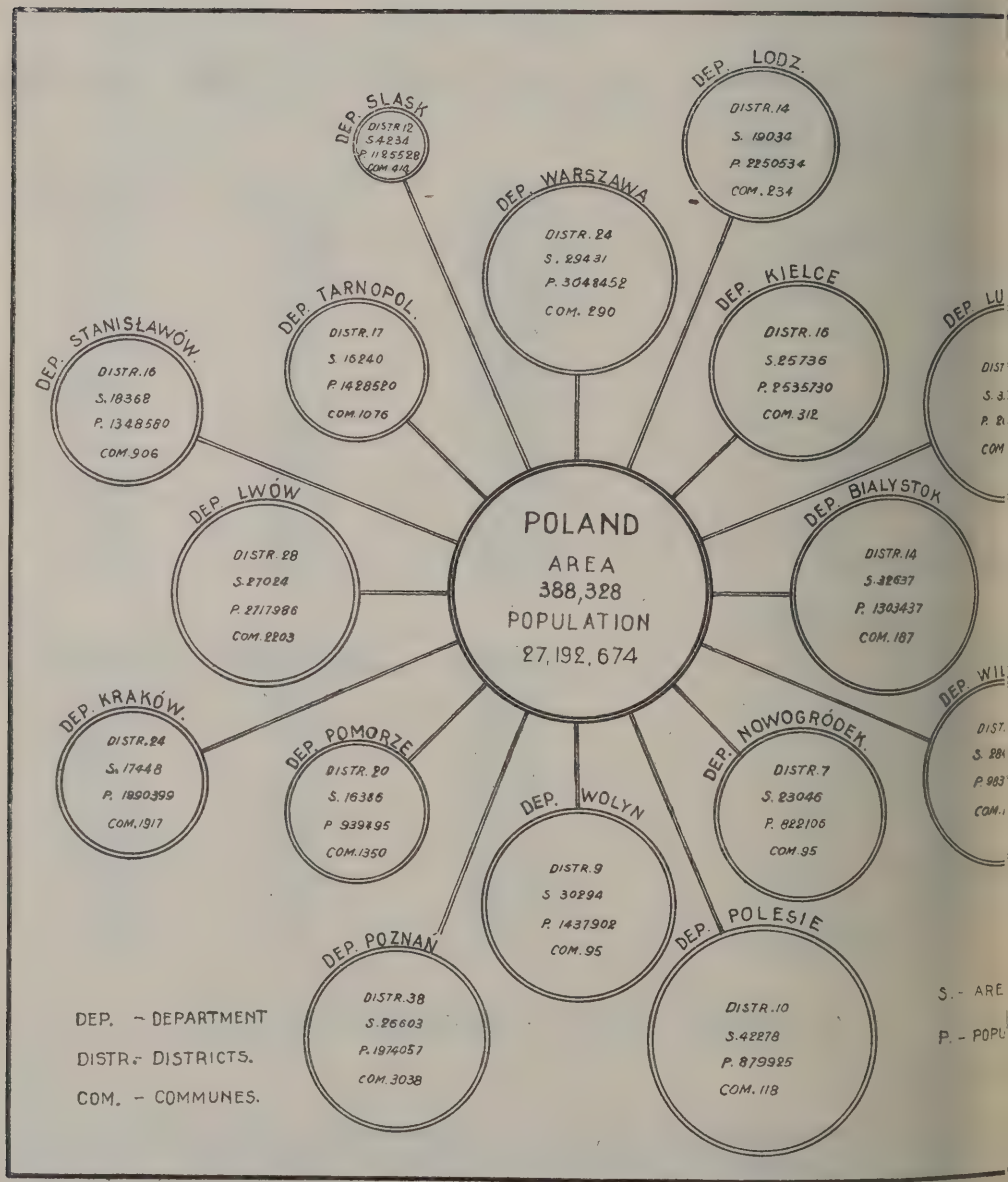


Table N° 3

HEALTH SERVICES OF THE DIFFERENT MINISTRIES AND THEIR RELATIONS

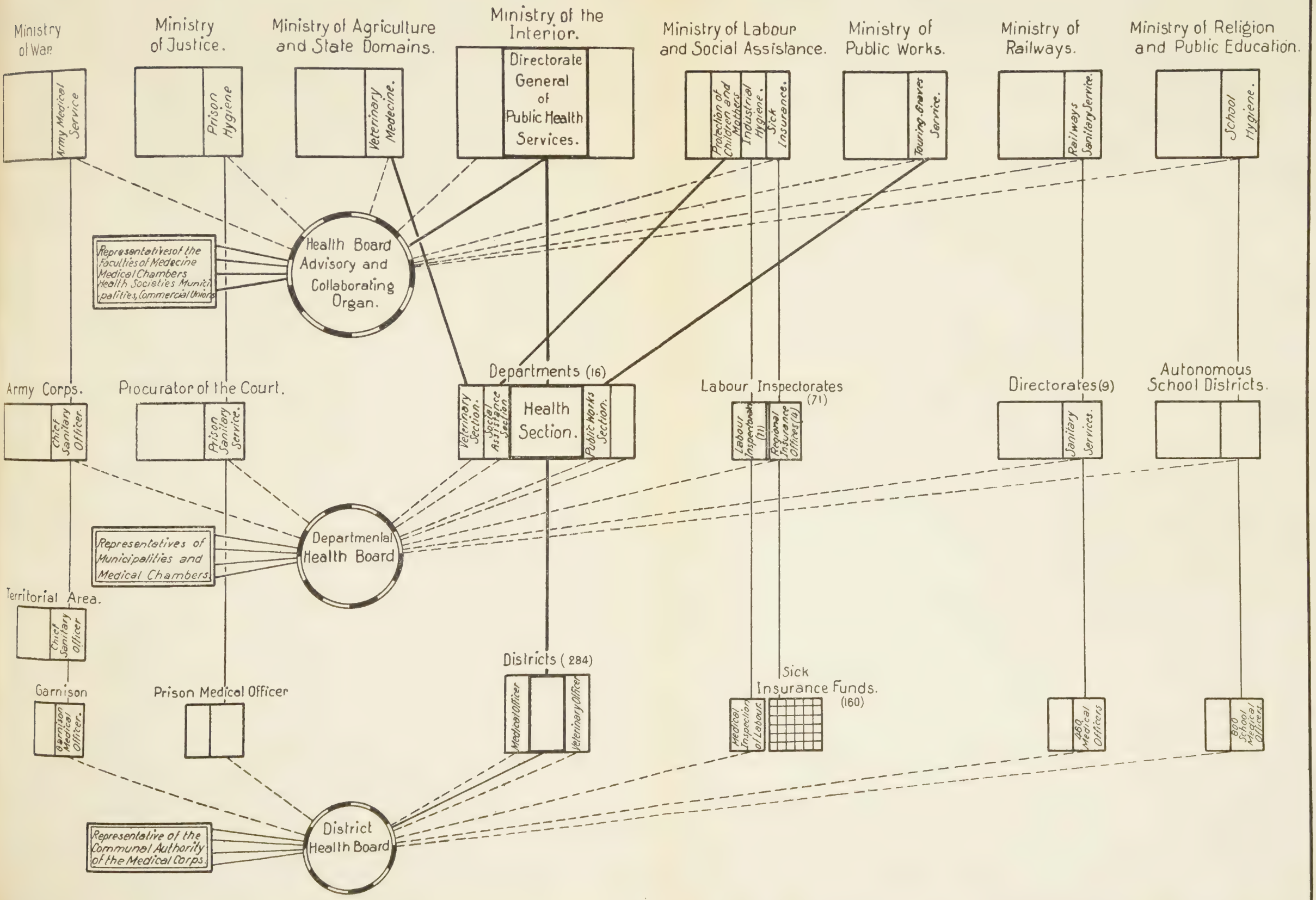
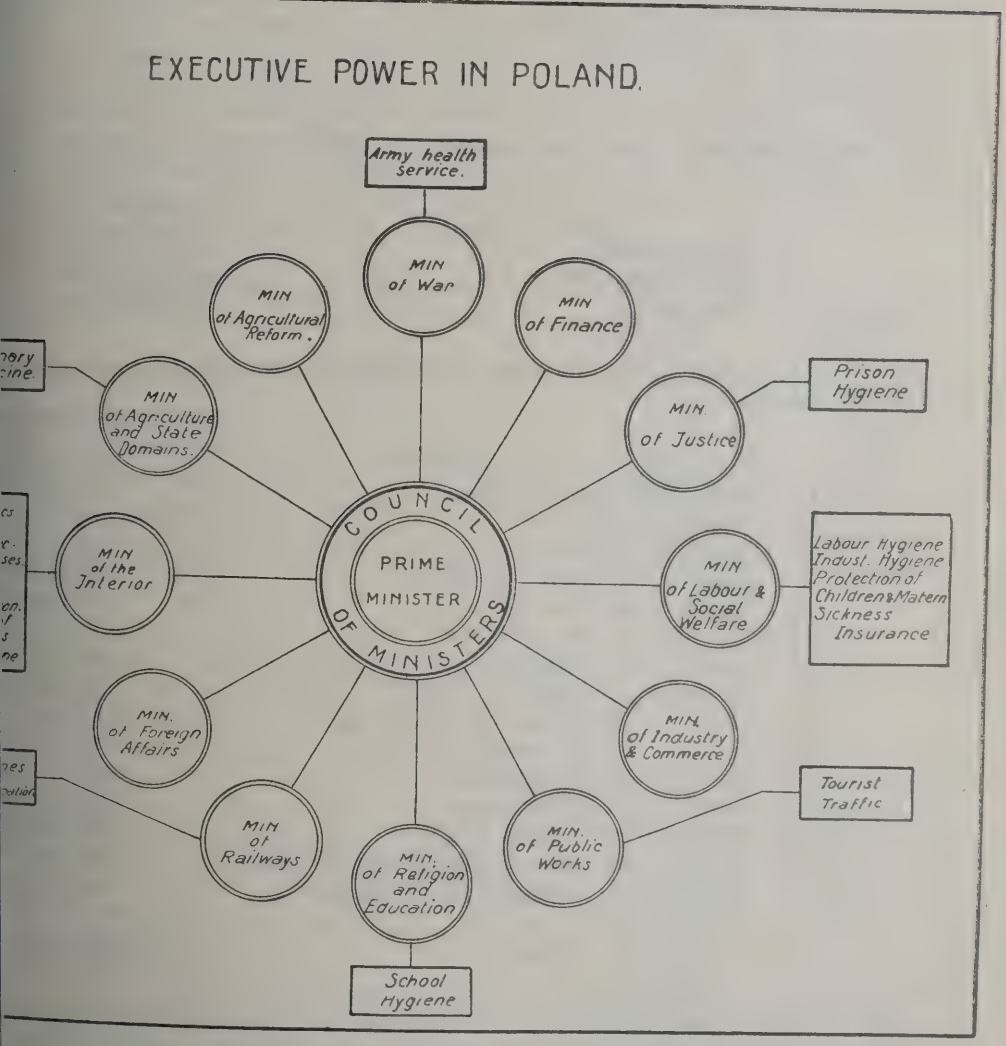


Table No. 2.


EXECUTIVE POWER IN POLAND.
Army health Service.
MIN of War
MIN of Agricultural Reform.
MIN of Finance
MIN of Agriculture and State Domains.
MIN. of Justice
Prison Hygiene
COUNCIL OF MINISTERS
PRIME MINISTER
MIN of the Interior
MIN of Labour & Social Welfare
Labour Hygiene Indust. Hygiene Protection of Children & Matern Sickness Insurance
MIN. of Foreign Affairs
MIN of Industry & Commerce
Tourist Traffic
MIN of Railways
MIN. of Religion and Education
MIN. of Public Works
School Hygiene

of the Board are : (1) To give advice in all matters regarding public health w submitted for the consideration of the Board by the General Director of th Health Service; (2) to prepare new bills to be submitted to the Diet; (3) to init direct investigations necessary for the solving of definite practical sanitary p

The activities of the Board in 1925 consisted in the collection of material codification of the general public health law, in the making of a tuberculosi in the city of Bialystok, and of an investigation into the prevalence of trac all the orphanages of the country.

2. *The Budget.*

The expenditures of the State budget for 1925 were as follows[1] :

	Polish Zlotys
A. Administration	2,020,106,408
B. State Enterprises	1,102,386,830
C. Monopolies	343,202,844

The following table shows the sums provided in the budget for various of the Administration :

		Polish Zlotys
I.	President of the Republic	2,131,268
II.	The Diet and the Senate	9,444,253
III.	State Control	4,472,006
IV.	Cabinet Council	1,747,628
V.	Ministry of Foreign Affairs	24,444,267
VI.	Ministry of War	710,100,000
VII.	Ministry of the Interior	207,148,937
VIII.	Ministry of Finance	329,413,920
IX.	Ministry of Justice	90,640,636
X.	Ministry of Commerce and Trade	114,669,053
XI.	Ministry of Railways	2,858,920
XII.	Ministry of Agriculture	25,319,045
XIII.	Ministry of Education	323,316,253
XIV.	Ministry of Public Works	84,295,653
XV.	Ministry of Labour and Social Welfare ..	34,388,608
XVI.	Ministry of Agricultural Reforms	43,886,150
	Total	2,020,106,40

The appropriation for the General Direction of the Public Health Service has been included, as in 1924, in the budget of the Ministry of the Interior, been even more closely combined with the general budget of that Minis in the preceding year.

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[1] The statement of expenditure for 1925 is taken from the *Journal of Law of the Polish Republic*, 19 page 949.

)25, the allotments for salaries, special staff charges, travelling expenses- ıce of office quarters, general office expenses and the renovation and preser, buildings of the Central Health Administration and of the Provincial and lealth Administrations were included in the general budget of the Ministry terior. Consequently, the assignment for the budgetary chapter " Public rvice " was lower in 1925 than in 1924.

)priation in 1925: 7,919,164 Polish zlotys, as compared with 9,687,258)ended in 1924.

dition to the above-mentioned sum for the Public Health Service under the the " Ordinary Expenses " of the Ministry of the Interior, there have been n the chapter of " Extraordinary Expenses " of the Ministry 755,000 zlotys: nstruction of the State Training Schools for Midwives 355,000 zlotys and ate School of Hygiene 400,000 zlotys.

ppropriation for 1925 (ordinary plus extraordinary expenses) formed 0.59 f the Administrative Budget of Poland, and represented per head of the ı an expenditure of 0.41 zloty for health services.

letails of expenditure are given below :

	Polish Zlotys	Percentage of total expenditure
ılth Service : Total Appropriation	7,919,164	
Control of diseases	4,216,589	53.24
State Training Schools for Midwives ..	49,547	0.63
State Institute of Hygiene	1,046,647	13.22
State Pharmacological Institute	101,398	1.28
State Food Control Institute	336,413	4.25
Medical assistance to State officials ..	2,168,570	27.38

Detailed Financial Report.

Part I.

	Polish Zlotys	Polish Zlotys
Disease		4,216,589
culosis control	260,000	
eal disease control	351,163	
oma control	331,655	
ol of acute communicable diseases ..	1,011,771	
ır treatment for the poor	10,000	
tal subventions and health resorts ..	1,752,000	
ılsory smallpox vaccination	500,000	
	4,216,589	
Carried forward		4,216,589

Brought forward	
Part II.	
State Training Schools for Midwives	
Salaries	44,528
Special staff charges	2,077
Maintenance of office quarters	360
General office expenses	1,088
Miscellaneous	300
Repairs and renewals	30
Special charges	1,164
	49,547
Part III.	
State Institute of Hygiene	
Salaries	583,138
Special staff charges	9,041
Travelling expenses, subsistence allowances, transportation	6,000
Transport service	3,262
Maintenance of office quarters	141,363
General office expenses	18,254
Miscellaneous	1,775
Repairs and renewals of buildings	17,000
Serum and vaccine production	235,954
Upkeep of farm	13,000
Dormitories	13,420
International Office of Public Health (Paris) ..	4,440
	1,046,647
Part IV.	
State Pharmacological Institute	
Salaries	76,147
Special staff charges	1,091
Travelling expenses, subsistence allowances, transportation	309
Maintenance of office quarters	13,042
General office expenses	4,461
Miscellaneous	100
Repairs and renewals	100
Laboratory equipment	5,348
Control of arsenobenzol	800
	101,398
Carried forward	

	Polish Zlotys	Polish Zloty
Brought forward		5,414,181
Part V.		
trol Institute	.. .. ..	336,413
ries	275,758	
ial staff charges	4,425	
elling expenses, subsistence allowances, trasnportation	4,746	
tenance of office quarters	26,200	
ral office expenses	7,644	
llaneous	1,140	
vation and repairs of buildings	3,500	
ratory equipment	13,000	
	336.413	
Part VI.		
ssistance to Government officials ..	.. .. ..	2,168,570
ies	1,134,400	
ital treatment	270,000	
ine	450,000	
h-resort treatment	240,000	
benefits	74,170	
	2,168,570	
Total ..	.. .. ..	7,919,164

e total expenditures of the Public Health Service, 53.24 per cent was for the disease. The appropriation was chiefly for the campaign against contagious cute and of long duration.

udgetary allotment for the control of acute contagious diseases was divided : *(a)* Maintenance of 750 epidemic beds in the eastern provinces, 803,723) transport service for medical inspection in those provinces, 13,048 zlotys ; ative vaccination against typhoid fever, dysentery and scarlet fever, 50,000) upkeep of sanitary control stations on the Russian frontier, 30,000 zlotys ; tion of disinfecting apparatus, 25,000 zlotys.

utlay on the control of tuberculosis was 260,000 zlotys, *i.e.*, sixteen times the allotment for 1924. The funds were distributed as follows : *(a)* Sub- sanatoria, 110,000 zlotys ; *(b)* improvement in the equipment of sanatoria saries, 67,000 zlotys ; *(c)* subvention to thirty new dispensaries, 33,000) grants to anti-tuberculosis societies and associations and scientific 50,000 zlotys.

st of venereal disease control was 351,163 zlotys, as compared with 198,186 924. The sum set apart for the purpose in 1925 included 197,702 zlotys trol of prostitution, and 73,670 zlotys for the maintenance of free venereal- spensaries.

eatest increase in the sum assigned was for the control of trachoma, for nance of special establishments for trachomatous children and for trachma

dispensaries. There were appropriated, in 1925, 331,655 zlotys, as agai zlotys in 1924. The actual difference is not, however, really so great, in 1924, large sums for the maintenance of the establishments for trac children were included in other items of the budget.

The expenditure for the training of the Public Health personnel amo 1925 to 341,901 zlotys, distributed as follows : (1) State Training Schools for 49,547 zlotys ; (2) 25,000 zlotys for the nursing schools (included in the ite pital subventions) ; (3) State School of Hygiene, 267,354 zlotys, contained in t of the State Institute of Hygiene).

Among other Ministries (the Ministry of War not included) assignments f work were made by : *(a)* The Ministry of Education, which set aside 35,5 for school hygiene (19,400 zlotys in 1924) ; *(b)* the Ministry of Justice, which 492,383 zlotys for hygiene in prisons ; and *(c)* the Ministry of Labour a Welfare[1], which made an appropriation of 430,975 zlotys, of which 138,0 used for maternity and child welfare, and 292,900 spent for the care of tu and trachomatous children.

The second part of the State budget, " State Enterprises ", includes zlotys for the development of health resorts; 10,454,007 zlotys for medical a to railway employees ; and 2,331,700 zlotys for the cleaning and disinfecting o coaches.

III. PUBLIC HEALTH LEGISLATION.

International Convention.

The ratification of the Sanitary Convention between Poland and La place in Warsaw on April 7th, 1925.

IV. GENERAL EPIDEMIOLOGY[2].

In Poland, there was no epidemic of importance during the year 1925. cations of typhus received during this period show a considerable decline in dence of the disease. Marked improvements are also to be noted in th concerning relapsing fever and smallpox. The situation was less favour regard to typhoid fever. Infectious diseases in children were on the incr

1. *Smallpox.*

Of smallpox, 77 cases were notified, resulting in 3 deaths, as compared cases and 126 deaths registered in 1924.

The city of Warsaw, the provinces of Lodz, Stanislawow and Lwow from the disease.

---

[1] In addition, certain appropriations for health work among children were included in the budget of of Labour under the heading : (1) Subvention and grants for organisation and associations for the care and young people; total appropriation, 4,323,845 zlotys; (2) summer colonies, for which 200,000 zlotys wer

[2] A table showing the number of cases of notifiable diseases reported in Poland in 1925 and the numb caused by these diseases is to be found in *Epidemiological Intelligence*, No. 10, page 136.

ES.

s alis	Tuberculosis		Trachoma	
70	2,470	2,019	—	—
16	219	409	281	—
3	58	179	42	—
5	502	305	188	—
4	299	49	91	—
38	126	1,273	211	—
7	723	603	810	—
19	2,044	1,737	769	—
9	273	518	93	—
7	290	348	86	—
41	54	769	1,106	—
28	56	178	140	—
1	1,200	40	258	—
—	195	8	65	—
11	350	6	187	—
—	188	10	379	—
27	138	860	45	—
86	9,185	9,311	4,751	—

Table No. 4.

NUMBER OF CASES OF AND DEATHS FROM COMMUNICABLE DISEASES REPORTED IN 1925; BY PROVINCES.

Province	Variola		Typhus abdominalis		Para-typhus		Typhus exanthema-ticus		Typhus recurrens		Dysenteria		Scarlatina		Diphtheria		Meningitis		Morbilli		Erysipelas		Pertussis		Malaria		Sepsis puerperalis		Tuberculosis		Trachoma	
Warsaw (city)	—	—	1,140	148	—	—	67	7	2	—	229	20	2,046	237	485	99	55	43	6,496	261	878	38	583	137	87	—	56	70	2,470	2,019	—	—
Warsaw	2	—	1,397	107	3	—	87	5	—	—	55	2	1,852	179	346	35	36	24	2,889	9	141	5	282	11	30	—	45	16	219	409	281	—
Bialystok.	4	—	835	43	—	—	237	18	4	—	77	8	1,521	116	250	15	21	6	3,548	82	90	5	623	18	9	—	7	3	58	179	42	—
Kielce	3	—	1,449	102	3	—	220	26	3	—	125	12	1,037	77	295	16	29	24	4,987	65	92	6	555	34	20	—	33	5	502	305	188	—
Lublin	15	—	986	53	—	—	411	33	6	—	85	13	2,185	216	245	15	27	8	3,250	27	106	4	336	1	92	—	24	4	299	49	91	—
Lodz	—	—	2,119	158	—	—	35	4	1	1	183	11	1,764	267	839	84	56	80	3,670	53	119	11	443	41	16	2	109	38	126	1,273	211	—
Cracow	6	1	930	89	—	—	158	31	—	—	433	67	1,972	143	257	18	46	8	4,051	33	72	—	655	21	25	—	38	7	723	603	810	—
Lwow	—	—	1,104	100	—	—	752	72	5	1	388	69	3,033	422	414	74	40	14	8,867	432	83	1	2,777	239	22	—	25	19	2,044	1,737	769	—
Stanislawow	—	—	478	49	—	—	405	49	—	—	327	61	1,374	198	109	19	10	12	638	30	27	2	681	108	5	—	7	9	273	518	93	—
Tarnopol	1	—	364	28	—	—	379	50	—	—	99	11	1,212	169	135	15	7	6	1,229	10	28	1	721	53	3	—	8	7	290	348	86	—
Posen	3	—	543	58	—	—	1	1	—	—	417	43	2,025	115	698	37	30	9	2,045	10	40	3	117	2	24	—	121	41	54	769	1,106	—
Pomerania	1	—	438	39	—	—	9	3	—	—	65	5	1,579	115	229	24	3	4	582	3	29	—	83	4	8	—	76	28	56	178	140	—
Silesie	27	1	242	15	—	—	268	9	9	1	246	17	627	25	406	19	21	10	1,900	17	71	—	540	2	1,126	—	17	1	1,200	40	258	—
Plowgrodek	2	—	264	19	—	—	422	13	7	—	41	2	282	9	143	3	8	—	192	1	24	—	66	—	57	—	7	—	195	8	65	—
Volhynia	7	1	678	15	—	—	298	11	4	—	112	3	417	13	346	7	6	2	1,033	11	161	2	522	1	216	—	22	11	350	6	187	—
Wilno	4	—	847	53	—	—	447	6	63	—	216	3	1,258	64	280	28	26	2	3,918	47	125	2	1,305	5	31	1	42	—	188	10	379	—
Zilesia	2	—	205	23	—	—	—	—	—	—	187	10	1,026	38	341	59	31	9	1,633	21	40	2	146	10	6	1	146	27	138	860	45	—
Total	77	3	14,019	1,099	6	—	4,196	338	104	3	3,285	357	25,210	2,403	5,888	567	452	261	50,928	1,112	2,126	82	10,435	687	1,777	4	783	286	9,185	9,311	4,751	—

he 77 cases reported, 27 were registered in the province of Polesie (districts zyn and Stalin) and 15 in the province of Lublin. The remaining cases were roughout the country.

ntion should be called to the remarkable reduction in the smallpox fatality 925. During the previous years the fatality rate was about 16 per cent ; was only 3.90 per cent. It is difficult to say whether this low fatality rate a milder type of smallpox or whether the rarity of the disease this year the fact that some of the deaths due to smallpox were not recorded as such.

us.

curve of typhus had a downward trend. During the period under considera- 2 cases of the disease were reported, as compared with 7,706 in 1924 and 1919.

of the 4,282 cases notified in 1925, 10 were recorded in the two western : Pomerania and Posen (9 cases in Pomerania, 1 in Posen). Silesia was from the disease. In the remaining fourteen provinces, with a population 155, there were registered 4,272 cases, *i.e.*, 18.87 per 100,000 of population. sponding figures for 1923 and 1924 were 46.32 and 35.25 respectively. It noted that, in the central provinces, practically all the cases of typhus egistered ; in the eastern provinces, however, notification probably does l 50 per cent.

empting comparisons of death rates from year to year, it should be remem- the registration of causes of death is enforced in some of the larger cities

atality rate from typhus was very stable during the period 1919 to 1925, om 7.49 to 8.64 per cent. This regularity is worthy of note. The only was in 1920 (the year of the war), when the fatality rate reached 14.02

25, the lowest fatality rate was recorded in the eastern provinces. This plained by the fact that the registration of causes of death is practically nt in this part of the country.

ing Fever.

gain shows a much more marked diminution. The reports for 1925 give r of notified cases as 104, while the corresponding figure for 1924 was 366, 22 (the year of the climax of the epidemic) 41,207.

of relapsing fever registered in 1925 were concentrated to a large extent vince of Wilno, which reported 63 cases ; the remaining eastern provinces 20 cases. The 21 cases which occurred in the central and western provinces regarded as imported.

Fever.

tuation with regard to enteric fever remains unchanged The highest f the disease was reported, as in previous years, from the central provinces, e of Lodz being first on the list, with 94 cases per 100,000 of population. rate was notified from the provinces of Posen and Silesia (27 and 18 cases respectively). The figures for the eastern provinces are somewhat higher :

the province of Nowogrodek, for example, registered 32 cases per 100,000, province of Volhynia 47.

The completness of the registration of enteric fever in different areas of th may be judged from the comparison of the respective fatality rates. It is c fatality rates may vary from one place to another, but hardly to the exte by the figures below.

Province or City	Fatality Rate per cent
Warsaw (city)	12.98
Silesia	11.22
Poznan	10.68
Pomerania	8.98
Wilno	6.26
Volhynia	2.21

5. *Dysentery.*

Dysentery has been much less in evidence in 1925 than during the previc The number of notifications was 3,285, as compared with 10,492 in 1924 a in 1921.

The incidence of the disease was highest in the three provinces Sta Lwow and Cracow, being, as usual, specially high in the latter (21.73 per Among the other provinces, dysentery was specially prevalent in the province which returned 21.19 cases per 100,000 inhabitants.

6. *Scarlet Fever.*

The cases numbered 25,210, with 2,403 deaths (*i.e.*, a fatality rate of cent). The corresponding figures for 1924 were 18,030 and 1,510 respecti

There is a large difference in urban and rural incidence of scarlet fev must be attributed to the incompleteness of registration in the rural district the six largest towns in Poland, Warsaw, Lodz, Lwow, Cracow, Posen an with a population of 2,105,491 (according to the Census of 1921), returned 4,673 cases of the disease, *i.e.*, 222 per 100,000, while in the remaining 2 of population, the notifications of scarlet fever numbered 20,537, *i.e.*, 82 per

The difference in the fatality rate between the group of the largest citie remaining localities is not so high as one might expect : 9.91 and 9.45 resp

7. *Diphtheria.*

A still greater dissimilarity exists in the rural and urban returns of d because of the uncertainty of diagnosis. The total number of cases in 192 as 5,888, resulting in 567 deaths (fatality rate, 9.63). The incidence rate i

ties was 73 per 100,000, and in the remaining area of the country 17. The ate was 14.30 in the largest towns and 7.97 for the rest of the population.

les.

sles was prevalent this year, especially in the province of Lwow. The number red cases was much greater than during the preceding years. The total f cases in 1925 was 50,928. It was 10,154 in 1924.
e figures are of course only approximate, because the duty of notification neglected with regard to measles.

ro-spinal Fever.

number of yearly notifications of cerebro-spinal fever in Poland varies from 0. In 1925, there were reported 452 cases and 261 deaths.
difficult to say how many of the cases notified as " cerebro-spinal fever " ascertained by bacteriological examination, and how many deaths recorded " meningitis " were due to cerebro-spinal fever.

phalitis Lethargica.

phalitis lethargica statistics are very incomplete. From the data available concluded that the disease was more prevalent in 1925 than during the pre- ar. According to the records, 157 cases of encephalitis lethargica with 24 re reported during 1925, as compared with 89 cases and 34 deaths returned

V. PREVENTIVE MEDICINE AND HYGIENE.

culosis.

igh a very large number of cases of tuberculosis fail to be notified, the regis- tuberculosis seems to be improving. In 1925, there were recorded 9,185),311 deaths, while the corresponding figures for 1923 were 5,725 and 10,137 y. In 1919, the number of cases notified to the Ministry of Health was he number of deaths 10,137.
ding to the information of the Central Statistical Office for 1925, deaths culosis in the ten largest cities of Poland, with a population of 2,655,591, 6,494, *i.e.*, 24.45 per 10,000 inhabitants. The distribution of the deaths o specified cities and forms of the disease is given in Table No. 5.
interest to note that, of these ten cities, the highest death rate was recorded of Cracow and the town of Sosnowice, notwithstanding that the population has a residentiary character and Sosnowice is an entirely industrial town).
tailed information concerning the distribution of tuberculosis by sex and ilable for the year 1924 for the two largest cities of the country, Warsaw Table No. 6).

This table shows that the death rate among the Christian population of is higher than among the Jewish. The total number of deaths from tuber 1924 is given as 2,646. Out of these, 2,247, or 84.9 per cent, were Christians or 15.1 per cent, were Jews. The percentage composition of the Warsaw po according to the Warsaw Statistical Office, was in 1924 : 66.8 per cent Chris 33.2 per cent Jews.

The experience of the city of Lodz was similar. The percentage of th population in 1921 was 34.5, while the percentage of deaths from tuberculos group of the population in 1924 formed only 15.2 per cent of the total dea tuberculosis.

There has been an excess of male mortality from tuberculosis in both c Warsaw, males form 45.48 per cent of the population, and the deaths from tul among males were 54.42 per cent of the total deaths from tuberculosis. T sponding figures for Lodz are 47.5 and 53.3 respectively.

TABLE No. 5.

DEATHS FROM TUBERCULOSIS IN TEN CITIES IN POLAND IN 1925.

City	Population	Tuberculosis of the respiratory system	Tuberculosis of the meninges	All other forms	Total
Warsaw	999,343	1,788	377	125	2,290
Lodz	527,242	1,146	134	85	1,365
Sosnowice	95,833	282	14	25	321
Lublin	103,206	253	28	37	318
Bialystok	86,095	178	1	5	184
Posen	209,947	431	—	—	431
Bydgoszcz	100,804	132	—	13	145
Cracow	187,108	505	67	55	627
Lwow	232,702	438	60	138	636
Katowice	113,311	160	7	10	177
Totals	2,655,591	5,313	688	493	6,494

TABLE No. 6.

DEATHS FROM TUBERCULOSIS BY SEX AND RACE IN WARSAW AND LODZ I

City	Pulmonary Tuberculosis				Other (non-pulmonary) forms of Tuberculosis				All forms of Tuberculos			
	Christ.	Jews	Males	Females	Christ.	Jews	M.	F.	Christ.	Jews	M.	
Warsaw	1,823 86.1	295 13.9	1,180 55.7	938 44.3	424 80.3	104 19.7	260 49.2	268 50.8	2,247 84.9	399 15.1	1,440 54.4	1, 4
Lodz	1,155 85.9	189 14.1	723 53.8	621 46.2	155 77.1	46 22.9	101 50.2	100 49.8	1,310 84.8	235 15.2	824 53.3	7 4

TABLE No. 7.

DISTRIBUTION OF DEATHS FROM TUBERCULOSIS IN WARSAW AND LODZ IN 1924.

City	Under 1 year	1-4	5-9	10-14	15-19	20-29	30-39	40-49	50-59	60 and over	Total
w	196	342	82	106	223	506	429	323	240	199	2,646
	7.4	12.9	3.1	4.0	8.5	19.1	16.2	12.2	9.1	7.5	100
.. ..	111	177	52	60	126	329	228	205	140	117	1,545
	7.2	11.5	3.4	3.9	8.1	21.3	14.7	13.3	9.1	7.5	100

n Table No. 7 are given the deaths from tuberculosis in Warsaw and Lodz for s age groups. The percentage distribution of deaths occurring in different age s corresponds to the type usually met with; the death rate is highest in child- nd in the age group 20-29.

he country is urgently in need of special hospitals for advanced cases of tuber- . According to the statistics of the city of Warsaw, in the year 1924, out of the registered cases of open tuberculosis, only 1,201, or 43.2 per cent, were isolated pitals. From among the tuberculous who died in hospitals in that year, 58.12 nt were isolated in general hospitals only one month before death.

uring the year under consideration, the first tuberculosis survey was inaugurated Public Health Services in the city of Bialystok. This city, a manufacturing where a large part of the population is insured, seemed to be a suitable place ch an investigation.

he aims of the investigation were : (1) To examine thoroughly a group of inha- s of Bialystok, consisting of 400 families, of whom 200 were Christian and 200 ., *i.e.*, about 2,000 persons, chosen at random regardless of their state of health dividual symptoms ; (2) to undertake a detailed examination of school-children, t's test being applied in a number of schools ; (3) to make use of all data collected health insurance authorities, by medical officers for the poor, by the few existing saries and by medical practitioners.

ne National Tuberculosis Association was organised in 1925 and eighteen local ations have been accepted as members.

ne problem of securing a sufficient number of well-trained specialists and suitable for tuberculosis work is still pressing. In 1925, the National Tuberculosis ation, conjointly with the Ministry of Labour and Social Welfare, held two six- courses for 70 nurses. About 50 medical men have passed a four-weeks course ning in tuberculosis work. These courses also were conducted by the National culosis Association.

ne publication of the periodical, *Tuberculosis*, was begun by the National culosis Association.

he first National Tuberculosis Convention was held at Cracow in May 1925.

2. *Cancer.*

Information regarding the mortality from cancer by sex and race is avail
the city of Warsaw for the years 1924 and 1923.

TABLE No. 8.

DEATH RATE FROM CANCER IN THE CITY OF WARSAW IN 1924 AND 1923 BY S
AND RACE.

Year	Population	Total Deaths		Per 10
1924	965,237	804		83
1923	,,	746		77
	Males	Per 100,000	Females	Per 10
1924	316	71.98	488	92
1923	312	71.07	434	80
	Christians	Per 100,000	Non-Christians	Per 10
1924	588	91.20	216	67
1923	519	80.49	227	70

The table shows that females have been more frequently subject to the
than males, and that cancer is more prevalent among the Christian than amo
Jewish population. Similar observations have been made in other localities.

As for Lodz, the total number of deaths from cancer in 1923 amounted
or 79 per 100,000. The corresponding figures for 1924 were 326 and 63 respec

The percentage of deaths from cancer in the hospitals in Warsaw was 23.46
and 26.86 in 1924. In Lodz, 14.41 per cent of the deaths from cancer in 192
place in hospitals.

3. *Venereal Diseases.*

Anti-venereal work has been carried on along the same lines as in 1924. I
prised : (1) Free treatment of venereal diseases in special dispensaries ; (2)
of the population in endemic centres of syphilis ; (3) control of prostitutes.

1. During the year 1925, five new dispensaries were established and by t
of the year a total of 25 dispensaries were in operation.

Province	Number [1] of Dispensaries	Number of treated in
Cracow	3	48
Stanislawow	9	4,92
Lodz	1	29
Bialystok	1	18
Volhynia	3	15
Warsaw (city)	1	69
Tarnopol	1	28
Wilno	2	1,06
Total	21	8,08

[1] Information not yet available for the remaining four dispensaries.

Table No. 9.

Venereal Diseases Census, September 1st to 30th, 1925. Civil Population

Province	Population	Gonorrhœa					Soft Chancre			Syphilis					Total Venereal Diseases					Per 10,000 of population
		Adults		Children			Males	Females	Total	Adults		Children			Adults		Children			
		Males	Females	Males	Females	Total				Males	Females	Males	Females	Total	Males	Females	Males	Females	Total	
Warsaw (city)	992,450	2,778	411	4	52	3,245	119	19	138	1,070	971	58	68	2,167	3,967	1,401	62	120	5,550	55.92
Warsaw	2,112,798	370	126	5	8	509	23	4	27	227	147	11	12	397	620	277	16	20	933	4.41
Lodz	2,252,769	1,029	376	3	32	1,440	60	5	65	815	701	24	33	1,573	1,904	1,082	27	65	3,078	13.66
Kielce	2,535,781	455	184	5	4	648	39	9	48	336	161	18	14	529	830	354	23	18	1,225	4.83
Lublin	2,087,951	352	119	—	11	482	14	1	15	214	125	19	12	370	580	245	19	23	867	4.15
Bialystok																				
Wilno										No figures										
Nowogrodek																				
Polesie	880,898	137	110	—	2	249	8	—	8	103	63	4	12	182	248	173	4	14	439	4.98
Volhynia	1,437,907	340	65	1	4	410	21	—	21	198	114	13	16	341	559	179	14	20	772	5.37
Posen	1,967,649	1,582	604	5	17	2,208	85	18	103	850	476	18	27	1,371	2,517	1,098	23	44	3,682	18.71
Pomerania	935,679	582	243	2	21	848	24	2	26	326	187	8	19	540	932	432	10	40	1,414	15.11
Silesia	1,124,967	712	234	1	9	956	53	8	61	503	323	49	62	937	1,268	564	50	72	1,954	17.37
Cracow	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lwow	2,718,014	657	310	—	11	978	28	7	35	430	256	34	35	755	1,115	573	34	46	1,768	6.5
	19,046,863	8,994	2,782	26	171	11,973	474	73	547	5,072	3,524	256	310	9,162	14,540	6,378	282	482	21,682	11.38

2. Examinations to detect the incidence of syphilis were conducted i in 66 communes of the province of Stanislawow, with a population of 134,299. inhabitants were examined and 752 were found to be syphilitic. The total r of persons inspected since the beginning of the survey was 32,561, of which 2, 6.41 per cent, proved to be infected with syphilis.

The result of the September census at the time of writing was available o 11 provinces out of 17 (see Table No. 9).

3. Until the bill providing for the compulsory treatment of all persons su from venereal diseases is passed, the compulsory treatment of prostitutes is con important in preventing the spread of venereal diseases.

4. *Malaria.*

In order to collect information with regard to the incidence of this dise investigation was made by the State Institute of Hygiene in some of the distr the provinces of Lublin, Polesie and Volhynia, which are considered to be very rious. The investigation comprised the determination of the spleen rate a detection of carriers of the malaria parasite. Out of the total of 11,200 c examined, 1,061 (or 9.47 per cent) had enlarged spleen. The details of the ex tions were as follows :

	District	Number examined	Number with enlarged Spleen	Spleen Rates per cent
1.	Pinsk	2,923	620	21
2.	Sarny	406	70	17
3.	Drohiczyn	335	47	14
4.	Luniniec	363	48	13
5.	Luboml	364	46	12
6.	Brześć	914	100	11
7.	Luck	459	48	10
8.	Kobryn	864	89	10
9.	Wlodawa	1,479	136	9
10.	Kowel	1,327	65	4
11.	Rowno	1,163	5	0.4
12.	Zdotunowo	602	0	0

There were examined 1,342 blood specimens. Out of this total, 156, or per cent, were infected with *plasmodium vivax.*

The investigation was made by three units, each consisting of one phy and a sanitary inspector specially trained for the purpose by the protozoo division of the Institute. Whilst the work was going on, quinine was distr free in the districts, and an effort made toward the education of the people.

The number of notified cases of malaria in the returns of district medical o was 1,777, of which 1,126 were reported from the province of Polesie.

5. *Trachoma.*

An inspection was made in the orphanages throughout the country, comp about 80,000 children. The result of the investigation tabulated for six pro shows that, among the 12,523 children examined, 1,775, or 14.46 per cent trachoma. The number of special establishments for trachomatous children 11, with a bed capacity of 2,000. The trachoma dispensaries numbered which 7 were in the city of Warsaw.

oholism.

the anti-alcoholic campaign during the past year three facts should be noted : ystematic investigation of the different aspects of alcoholism has been begun Public Health Services, and is being carried out by the State School of Hygiene ; pecial anti-alcoholic dispensary has been opened in Warsaw ; (3) A national ion of all organisations engaged in the campaign was held at Katowice in ber 1925.

cotic Drugs.

amount of narcotic drugs imported into Poland in 1925 was lower than in There were imported :

Drug	Quantity
Cocaine	67 kg. 677
Opium	730 kg. 775
Morphine	102 kg. 915
Other narcotic drugs..	160 kg. 322

re was no export of narcotic drugs from Poland.

rnity and Child Welfare.

question of the protection of maternity is still acute. An enquiry conducted inistry of Labour and Social Welfare indicates that there are only two homes tant mothers, 15 prenatal clinics, 13 lying-in hospitals with 544 beds (of 1 in the city of Warsaw), and 4 homes for mothers and infants.

e are about 6,500 registered midwives. Of these, 750 are resident in the city w. Throughout the country (larger cities excluded) there is on the average ife for each 15,000 to 22,000 of the population, and for every 500,714 square s. One bed is available per 1,372 confinements per year. Consequently er of births in hospitals is very limited. The confinements which take place are attended by physicians in exceptional cases only, and the number of elivered by midwives is very large. Finally, a considerable proportion of nts in rural localities is attended by casual midwives without training. clearly a need for general improvement in obstetric work. The first step taken in this direction, and a six-weeks course of post-graduate training dwives has been organised.

number of infant welfare stations rose to 104, where 46,650 children were l. About 200 health visitors are known to have passed through special training during the year.

levelopment of anti-tuberculosis work among children continued during the 13 additional dispensaries were established. Grants were given for the on of special sanatoria for tuberculous children in Zakopane (300 beds), beds), and to the open-air school at Skolimow for 400 children.

d deal of attention has been paid to the problem of trachoma. Additional ents for trachomatous children were opened in Warsaw (150 beds), at

Srem (150 beds) and at Maczki (120 beds). Preparations are being made opening of 15 establishments in the provinces of Polesie, Nowogródek and city of Czestochowa, with a total accommodation for 1,210 children.

9. *School Hygiene.*

From the medical examination of over 110,000 children in secondary during the school year 1923-24, it has been possible to gather a considerable of data concerning the general health of the children. The various defects fo given in Table No. 10.

Dental caries was the most common defect met with — in 35.9 per cen children examined. Malnutrition has been found in 9.98 per cent.

2.4 per cent of the children had enlarged adenoids, 2.3 per cent had organ disease, 14.9 per cent suffered from defective vision.

The diagnosis of tuberculosis (all forms) has been made in 3.4 per cent school-children.

TABLE No. 10.

MEDICAL INSPECTION OF SECONDARY SCHOOLS IN 1923-24.

	Total	Boys	Girls	Total	Boys
Number of children medically inspected	110,029	70,455	39,574		
	Actual number			Percentage	
Defective Nutrition	10,973	6,461	4,512	9.98	9.16
Enlarged Adenoids	24,452	12,933	11,519	24.0	18.3
Spinal Curvature	6,767	2,928	3,839	6.55	4.1
Rickets	4,315	2,690	1,625	3.22	3.8
Organic Heart Disease	2,604	1,739	865	2.3	2.4
Hernia	459	418	41	0.48	0.59
Tuberculosis (all forms)	3,818	2,145	1,673	3.4	3.0
Mouth Breathing	4.259	2,009	2,250	3.8	2.8
Caries of the Teeth	39,536	25,740	13,796	35.9	36.5
Defective Speech	874	623	251	0.78	0.88
Defective Vision	16,448	9,288	7,160	14.9	13.1
Defective Hearing	2,248	1,248	1,000	2.0	1.7
Frequent Epistaxis	1,415	818	597	1.2	1.15
Headache	6,785	2,090	4,695	6.1	2.9
Cripples	570	422	148	0.5	0.59

10. *Physical Education.*

During the year 1925, a good deal of attention has been paid to problems to physical education.

Central Board for the promotion of physical education and training camps has eated in the Ministry of Education. The aims of the Board are to propagate n of physical education throughout the country, to co-ordinate the activities e agencies engaged in this work, and to make a scientific study of the problem. ard has its principal seat in Warsaw and branches in all provincial towns.

aching of Hygiene and Professional Training for the Health Worker.

ing the year under consideration, two courses of seven weeks for medical have been held at the State School of Hygiene. The courses have been l by 40 district medical health officers, who had to pass the examination by the Civil Service.

public health demonstrations at Mokotow (a suburb of Warsaw) and at vice inaugurated the work early in 1925. The demonstration at Mokotow s eight dispensaries, a day sanatorium for children and a dental clinic. At time it serves as a training institution for the students of the State School ene and the Warsaw Nursing School. The rural health demonstration iewice comprises an infant-welfare station, a school-children's clinic and two ies (tuberculosis and trachoma).

pecial course of Social Hygiene was instituted at the University of Warsaw.

VI. GENERAL QUESTIONS.

Control.

four State Control Institutes (Warsaw, Cracow, Lodz and Posen) examined mples during the year and found 15,753 of them, or 29 per cent, to be adul- The great majority of these examinations were milk samples.

ction of Pharmaceutical Products.

otal examinations numbered, in 1925, 3,260, as against 1,630 made in 1924.

Institute of Hygiene.

were received and tested during the year 1925, 44,784 specimens. The vaccines was 2,082 litres; the output of sera, 3,999 litres; the output of 543,857 doses.

Control.

l control examinations to the number of 203 were made during the year. of samples of salvarsan examined was 36. Sterility tests numbered 412. ntage of adulterated serum samples was 10.8.

ians, Subordinate Medical Personnel, Students of Medicine.

umber of medical men in 1925 was 7,253, or 1 physician for every 4,000 of tion, of whom 403 were State officials. There were 1,845 dentists, 2,350 s " and 6,500 midwives. The medical schools had 4,005 students.

uls.

spital accommodation in Poland is given in the following table:

Table No. 11.

HOSPITALS IN POLAND IN 1925-26.

Province	Population	General Hospitals												Hospitals for Mental Diseases									
		I. State		II. General public hospitals		III. Communal hospitals		IV. Maintained by social agencies		V. Private		VI. Total		I. State		II. Communal hospitals		III. Maintained by social agencies		IV. Private		V. Total	
		Number of hospitals	Number of beds	Number of hospitals	Number of beds	Number of hospitals	Number of beds	Number of hospitals	Number of beds	Number of hospitals	Number of beds	Number of hospitals	Number o beds	Number of hosp.	Number of beds	Number of hosp.	Number of beds	Number of hosp.	Number of beds	Number of hosp.	Number of beds	Number of hosp.	Number of beds
1. Bialystok.. ..	1,307,826	2	55			26	1,147	8	386	2	15	38	1,603										
2. Kielce	2,535,781	1	100			25	1,302	15	845			41	2,247										
3. Cracow	1,992,810	2	1,455	9	853	3	348	13	971	4	172	31	3,799	1	550					2	56	3	606
4. Lublin	2,087,951					26	1,314	10	638	4	52	40	2,004										
5. Lwow	2,718,014	1	1,521	12	1,142	2	107	9	493			24	3,263	1	1,111					1	16	2	1,127
6. Lodz	2,252,769					30	2,429	7	594	5	94	42	3,117					3	550			3	550
7. Nowogrodek ..	824,045	6	400			8	233	3	51			17	684										
8. Polesie	880,898	3	212			12	405	7	419			22	1,036										
9. Pomerania ..	935,679					16	940	17	1,267	5	106	38	2,313			2	2,125					2	2,125
10. Posen	1,967,649	1	45			32	2,472	28	1,967	13	228	74	4,712			2	1,550					2	1,550
11. Silesia	1,124,967	1	65			18	1,483	36	5,428	10	157	65	7,133			2	1,962					2	1,962
12. Stanislawow ..	1,348,580			8	782	2	110	8	220			18	1,112										
13. Tarnopol.. ..	1,428,520			9	703			5	152			14	855										
14. Warsaw	2,112,798					33	1,485	7	563	4	130	44	2,178	1	662			1	310	2	40	4	1,012
15. Wilno	973,404	8	675			11	898	3	230	8	238	30	2,041			1	80					1	80
16. Volhynia.. ..	1,437,907	3	148			22	585	7	225			32	958										
17. Warsaw (city)	992,450	3	230			14	4,407	11	803	13	369	41	5,809			1	320			2	39	3	359

eneral Sanitary Conditions.

n improvement in sanitary conditions in the larger towns is expected from the -plant and sewage-disposal installations and the slaughter-houses which have naugurated in the following towns : Lublin, Czestochowa, Piotrkow and Radom. he preliminary work was carried out during the past year, and it is hoped that r towns will introduce similar improvements.

ıne 1926.

ROUMANIA

BY

Professor J. CANTACUZÈNE (Bucharest)

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I. GENERAL INTRODUCTION

ea : 295,000 square kilometers.

oulation (approximate figure for 1924) : 16,500,000 inhabitants.

ıe demographic statistics for 1925 not yet having reached the Central Statistical ment of the Ministry of the Interior, we shall confine ourselves to giving a few for the year 1924, in continuation of those which we published in the first of the *International Health Year-Book*.

eral Mortality, 1924.

(a) GENERAL DEATH RATE : 23.2 per thousand.

(b) NUMBER OF DEATHS.

e total number of deaths was 323,669 in the rural communes and 59,246 in an communes, which, including the 11,856 cases of still-birth, gives a total of deaths.

hs in 1924.

(a) BIRTH RATE : 37.7 per thousand.

(b) NUMBER OF BIRTHS.

	Live Births		Still-births
s	78,165	Towns	3,550
Communes	544,415	Rural Communes	8,306
Total	622,580	Total	11,856

(c) NATURAL INCREASE OF THE POPULATION : 227,809 inhabitants.

ıl Mortality, 1924.

(a) RATE OF INFANT MORTALITY : 20.08 per thousand.

difficult to give exact figures on the causes of mortality among infants in the There can be no doubt, however, that congenital syphilis and infantile ıteritis play a considerable part. We prefer, however, to await the results of iry which is at present in progress before furnishing more detailed information. shall confine ourselves for the moment to giving a few figures regarding the ion of mortality by provinces and by months.

(b) MORTALITY WITHIN THE FIRST EIGHT DAYS OF AGE, 1924.
GEOGRAPHICAL AND SEASONAL DISTRIBUTION IN THE TERRITORY OF THE OLD KI
OF ROUMANIA

	January	February	March	April	May	June	July	August	Sept.	Oct.	Nov.
Moldavia											
Towns	36	31	40	24	15	23	34	25	27	25	25
Departments2	62	269	337	357	265	257	232	240	233	248	200
Muntenia											
Towns	58	52	55	45	43	52	41	51	38	49	39
Departments	428	492	613	562	484	440	467	455	512	634	410
Oltenia											
Towns	9	6	11	7	14	9	8	11	12	14	8
Departments	121	162	178	192	194	143	142	168	157	197	154
Dobrudja											
Towns	10	21	23	12	21	15	10	18	13	11	8
Departments	85	113	121	106	96	83	85	93	79	84	63
Grand total.	1,009	1,146	1,378	1,305	1,132	1,022	1,019	1,061	1,071	1,262	907

It will be observed that the total mortality within the first eight days reac
lowest point in the months of November and December and its highest point in
and April.

(c) MORTALITY UNDER 1 YEAR OF AGE AND FROM 1 TO 5 YEARS, 1924.
GEOGRAPHICAL DISTRIBUTION IN THE TERRITORY OF PRESENT-DAY ROUMA

	From 0 to 1 year	From 1 to 5 yea
Moldavia	18,190	6,861
Muntenia	29,446	12,997
Oltenia	9,956	5,723
Dobrudja	7,156	2,973
Bessarabia	23,549	10,834
Bukovina	5,469	1,037
Transylvania	31,096	11,256
Total	124,862	51,681

6. *Budget.*

A. *General State Budget* for 1925 : lei 31,750,000,000.

B. *Budgets of the different Ministries :*

Ministry of Foreign Affairs	227,9
Ministry of Agriculture and State Domains	723,2
Ministry of Arts and Public Worship	551,5
Ministry of Communications	9,436,5
Ministry of Finance	7,607,4
Ministry of War	4,324,6
Ministry of Industry and Commerce	438,7
Ministry of Education	2,150,7
Ministry of the Interior	1,253,9
Ministry of Justice	512,0
Ministry of Health	901,0
Ministry of Public Works	306,2
Prime Minister's Department	3,2
Total	28,540,4

	Lei
Grants to employees and pensioners	2,000,000,000
Fund for the payment of war compensation and requisition orders	250,000,000
Fund for supplementary and extraordinary credits	959,541,231
Grand Total of the Budget	31,750,000,000

Budget of the Ministry of Public Health.

budget of the Ministry of Public Health in 1925 was 137,783,092 lei in excess or 1924.

s increase is divided between the following items :

	Lei
(a) Personnel	19,041,542
(b) Material	118,741,550
Total	137,783,092

budget of the Ministry of Public Health amounted to 2.83 per cent of the dget.

925, the Ministry of Public Health expended :

	Lei
(a) Campaign against epidemics	5,000,000
(b) Campaign against chronic diseases (malaria, tuberculosis, trachoma, syphilis)	13,000,000
(c) Purchase and repair of disinfecting apparatus . .	6,000,000
(d) Organisation of medical observation stations in the ports and in the interior of the country . .	500,000
(e) Maintenance of disinfection stations	200,000

ENT REFORMS IN HEALTH ADMINISTRATION AND LEGISLATION.

h Administration.

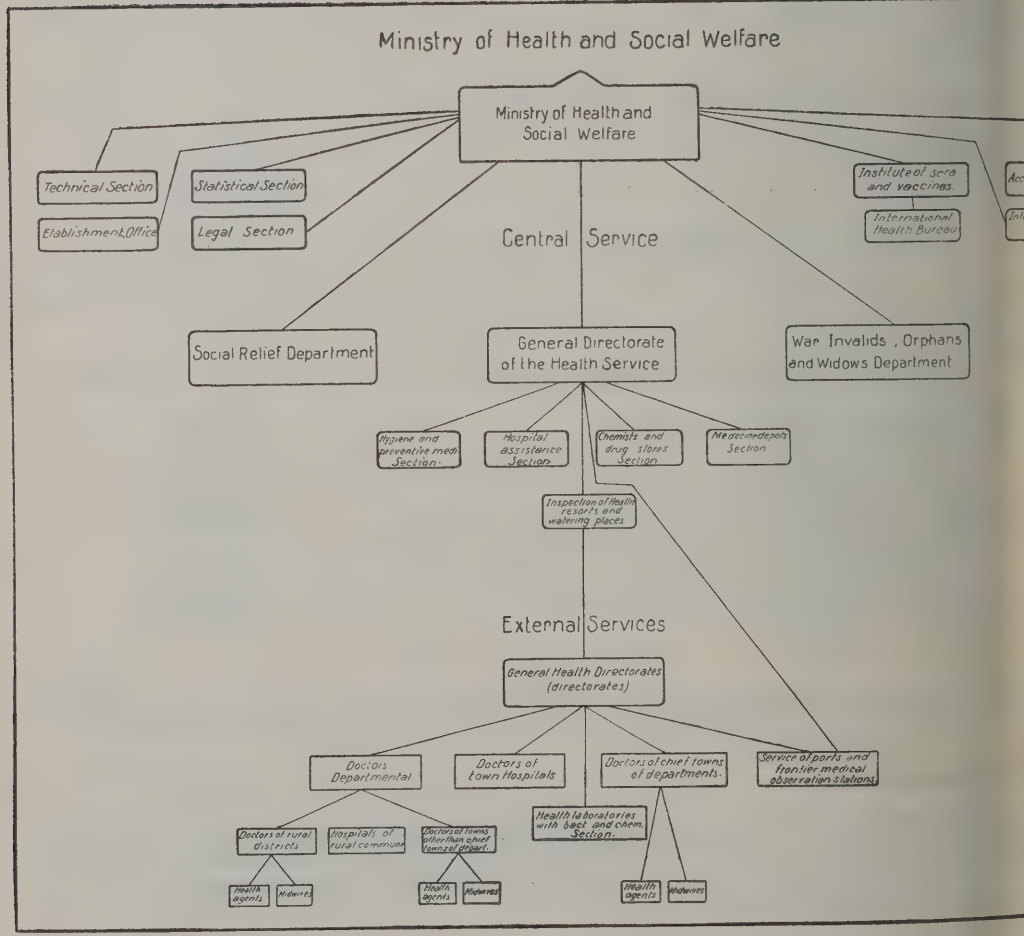
Health Ministry is at present considering a reorganisation of its services ll shortly be submitted to Parliament for approval. We attach a schedule wing page) of the present organisation of the central services, several will be modified by the new law.

Legislation.

eat number of health laws are now being drawn up, but none have yet been l to Parliament.

v on administrative decentralisation was, however, promulgated in 1925. result of the incorporation in the mother-country of the three new provinces lvania, Bukovina and Bessarabia, each of which possessed its own administra- m, it was found advisable to draw up an administrative law in order to

Public Health Organisation of Roumania.



e uniform methods of government for all those provinces. This law is founded e principle of decentralisation ; it has not been without a certain influence on orking of the health service. While the old legislation left all health questions in ands of the Health Ministry, only health questions of a general character are now n its jurisdiction, and the local application of the measures decided upon by the l authorities is left to the local administrative authorities.

The new draft law on the reorganisation of the services of the Health Ministry, the gulating the question of tuberculosis, the law on the administrative organisation ering-places and health resorts, and the new law on the exercise of the pharma- al profession are now under discussion by Parliament.

The only change made in the health police regulations is that encephalitis lethar- as been added to the number of diseases the notification of which is compulsory. egulations on school hygiene at Bucharest and general regulations concerning tores have been put into effect.

III. HEALTH INSTITUTIONS.

vanced Medical Training.

ne number of medical students entered at the three Faculties of Medicine follows :

Bucharest	1,808
Jassy...	602
Cluj	585
Total..	2,995

e total number of medical students entered for these three faculties in 1925 was rably smaller than in previous years. Immediately after the Great War, there trong movement in favour of medical studies : this movement, having reached ximum, is now tending to slow down.

e Health Ministry has created at the Faculty of Medicine at Jassy a compul- ourse of epidemiology ; this chair is attached to the Contagious Diseases al of the Health Ministry.

vo series of advanced courses provided for in the law concerning the health of the rural districts have been organised at the Faculties of Medicine at est and Jassy.

ndary Medical Training.

e school of visiting nurses at Cluj has been reorganised and reopened.
new school for visiting nurses has been created at Bucharest.

pitals and Social Relief Institutions.

(a) UNIVERSITY CLINICS.

spite the extreme financial difficulties of the present moment and the consi- impoverishment of the Ephoralty of the Bucharest Hospitals (due both to the in the cost of living and to the expropriation law which has affected even

philanthropic institutions), the administration of this Ephoralty has begun t
ganise the clinical services of the Bucharest hospitals which were in a flou
condition before the war but which urgently required extension owing to the i
in the number of students. Two of the medical clinical departments a
obstetrical clinical department of the Faculty have been considerably enlarg
are now in process of completion.

(b) HOSPITALS AND MEDICAL ESTABLISHMENTS CONSTRUCTED IN 1925

The Radiological Department of the Health Ministry instituted in 1923 h
enlarged and improved.

A hospital of oto-rhino-laryngology has been created at Galatz.

Twenty dispensaries for infants have been founded in various towns.

A department of prophylactic propaganda (under the Health Ministry) h
created.

The towns of Pitesti and Bacau have established a health laboratory un
authority of the Health Ministry, with chemical and bacteriological sections.

The Tekir-Ghiol Hospital, the property of the hospital Ephoralty, wh
been ceded for five years to the Directorate of the I. O. V. (war invalids, c
and widows) and was destroyed during the war, was completely rebuilt in
The Geoagiul Sanatorium has been enlarged.

(c) HOSPITALS COMPLETED IN 1925.

Botosani Isolation Hospital.
Constantza Disinfection Station.
Marinoiu-Costachesco Hospital at Targovista.
Bivolari Hospital at Jassy.
Vidra Hospital, Putna.

(d) HOSPITALS IN PROCESS OF CONSTRUCTION AND ENLARGEMENT.

Hospital for Infectious Diseases, Craiova.
Brasov Hospital.
" Principesa Ileana " Hospital, Abrud.
Aiud Hospital.
New Maternity Home, Craiova.

(e) SOCIAL HELIEF INSTITUTIONS.

The sum of 111,402,816 lei was appropriated for the General Directo
Social Welfare attached to the Health Ministry under the latter's budget for

IV. INFECTIOUS DISEASES.

1. *Movement of Infectious Diseases in* 1925.

The epidemic disease with the greatest number of cases in 1925 was wh
cough, of which there were 15,538 cases, 1,105 being fatal. The health are
affected were : I, with 3,722 cases and 402 deaths ; VIII, with 1,625 cases
deaths ; V, with 1,601 cases and 95 deaths ; and VI, with 1,584 cases and 125

The case fatality of this disease was 7.11 per cent.

cond in order came scarlet fever, with 1,195 cases and 841 deaths. The t number of cases occurred in the following areas : XI, with 1,645 cases and ths ; IV, with 1,581 cases and 69 deaths ; VII, with, 1,559 cases and 169 deaths ; II, with 1,187 cases and 163 deaths. The case fatality of the disease was r cent, a very low figure compared to the normal case fatality of scarlet fever mania, which in general has been decreasing in the last twenty-five years. ble of health areas below and map on the following page.)

addition to the above, the most prevalent epidemic diseases were :

phoid fever, 6,557 cases, 708 deaths ; case fatality 10.8 per cent.

phus, 2,012 cases, 219 deaths ; case fatality 10.88 per cent.

phtheria, 1,421 cases, 223 deaths ; case fatality 15.6 per cent.

sentery, 944 cases, 107 deaths ; case fatality, 11.3 per cent.

lapsing fever, 31 cases, no deaths.

allpox, 27 cases, 2 deaths ; case fatality, 7.4 per cent.

e morbidity of typhoid fever has been rapidly decreasing in the last few years. crease is due to systematic vaccination in the army and in all districts where of infection appear. It should also be noted that there had been a rable recrudescence of smallpox after the war and that to-day it has almost ared, also owing to systematic vaccination.

TABLE OF HEALTH DISTRICTS AND THEIR SUBDIVISIONS

Chief Town	Departments
Craiova	Dolj, Gorj, Mehedinti, Valcea, Romanati, Hunedoara.
Pitesti	Arges, Olt, Teleorman, Dambovita, Muscel.
Bucharest	Ilfov, Ialomita, Buzau, Durostor, Constanta, Caliacra, Vlasca.
Brasov	Brasov, Prahova, Treiscaune, Sibiu, Tarnava-Mare, Tarnava-Mica, Odorhei, Alba.
Galatz	Covurlui, Tecuci, Cahul, Ismail, Tulcea, Braila, Tutova.
Bacau	Bacau, Roman, Neamtz, Ciuc, Putna, Ramnicu-Sarat.
Jassy	Jassy, Vaslui, Botosani, Soroca, Balti.
Cernautzi	Dorohoi, Suceava, Campulung, Cernautzi, Hotin, Radauti, Storojinet.
Chisinau	Lapusna, Orhei, Tighina, Cetatea-Alba, Falciu.
Arad	Bihor, Arad, Timis-Torontal, Caras-Severin.
Cluj	Cluj, Mures, Bistrita, Maramures, Satmar, Salaj, Somes, Turda.

ROUMANIE ROUMANIA
Chef-lieu de région sanitaire.
Chief town of Health area.
XI Nos des régions sanitaires.
Nos of the Health areas.
Cernăuti
VIII
VII
Iaşi
Chisinău
IX.
XI
Cluj
VI
Bacau
Arad
X
IV
V
Braşov
Galati
II
I
Slatina
BUCURESTI
III
Craiova

2. MORBIDITY AND MORTALITY OF CONTAGIOUS DISEASES IN 1925.

	Smallpox		Typhus exanthematicus		Scarlet Fever		Diphtheria		Relapsing Fever		Typhoid Fever		Dysentery		Whooping-cough		Encephalitis lethargica	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
. .	12	—	346	37	5,010	167	639	77	—	—	2,192	220	152	18	1,598	85	23	7
ts . .	15	2	1,666	182	6,939	674	782	156	31	—	4,365	188	792	89	13,940	1,020	15	12
. .	27	2	2,012	219	11,949	841	1,421	223	31	—	6,557	708	944	107	15,538	1,105	38	19

V. CAMPAIGN AGAINST CERTAIN INFECTIOUS DISEASES.

llpox.

allpox having been subject in the last twenty-five years to considerable fluc-
s, and being now in process of complete disappearance, it may be of interest
a survey of its history and of the present position in regard to this disease.

(a) HISTORY AND EVOLUTION.

umanian territory was severely afflicted with smallpox before 1899, although
tion had been compulsory for a long time. The year 1896 marked the begin-
a great epidemic which lasted until 1899. In the course of the year 1904, a
epidemic broke out which was confined to the department of Constanza and
orted from Constantinople by a family arriving from that town.
m 1910 to 1914, the frequency of smallpox fell off to a marked extent. It
fined to absolutely exceptional cases, nearly always in the neighbourhood of
sian frontier. The great majority of doctors, and especially of medical students,
er had an opportunity of seeing a single case. This situation was clearly
he regularity with which vaccination and revaccination was carried out on
sion of recruitment or on entering school.
ring the period from 1914 to 1922, smallpox suddenly assumed a widespread
character. The causes were, first, the great epidemic which ravaged Serbia
1914 and 1916 and was introduced into Roumania by the large numbers of
. During the war, from 1916 to 1919, smallpox was imported by the Turkish
ssian armies. It was in 1919 that the epidemic raged with the greatest
; during this period there was a recrudescence of the disease such as had not
ce 1896. Thanks to a strict system of vaccination on a large scale, the number
fell off rapidly. In 1922, it had already fallen to 37.
lay smallpox has become as rare as before the war.

The following tables show the fluctuations of the epidemic in Roum territory.

(b) SMALLPOX : MORBIDITY AND MORTALITY FROM 1882 TO 1897.

Year	Cases	Deaths
1882	16,113	2,516
1886	4,969	1,046
1887	6,690	1,471
1888	13,248	2,662
1889	5,547	285
1890	1,836	236
1891	2,882	244
1892	2,342	308
1893	3,083	289
1894	180	26
1895	2,683	238
1896	14,659	2,813
1897	8,541	1,512

(c) DISTRIBUTION OF SMALLPOX FROM 1898 TO 1924.

Year	Country Districts			Year	Towns	
	Communes infected	Cases	Deaths		Communes infected	Cases
1898	68	577	90	1898	8	55
1899	41	262	32	1899	13	135
1900	8	27	1	1900	3	14
1901	7	15	1	1901	1	3
1902	1	1	1	1902	6	55
1903	3	10	1	1903	2	4
1904	7	55	13	1904	8	18
1905	4	5	—	1905	3	6
1906	2	12	2	1906	2	2
1907	3	20	—	1907	1	1
1908	3	4	—	1908	3	5
1909	—	—	—	1909	3	3
1910	2	12	—	1910	3	5
1911	2	7	—	1911	1	9
1912	7	59	9	1912	1	11
1913	6	15	—	1913	2	29
1914	21	34	7	1914	5	28
1915	21	178	44	1915	6	50
1919	706	174,77	4,981	1919	57	3,076
1920	80	817	180	1920	23	117
1921	20	79	15	1921	13	39
1922	9	15	1	1922	10	22
1923	26	48	7	1923	20	41
1924	5	6	1	1924	3	3

(d) GEOGRAPHICAL DISTRIBUTION OF SMALLPOX IN 1925.

Country Districts			Health District	Towns		
Communes infected	Cases	Deaths		Communes infected	Cases	Deaths
—	—	—	I	—	—	—
—	—	—	II	1	1	—
—	—	—	III	1	1	—
1	3	1	IV	1	1	—
—	—	—	V	—	—	—
1	6	—	VI	—	—	—
—	—	—	VII	—	—	—
1	1	1	VIII	—	—	—
2	3	—	IX	1	9	—
—	—	—	X	—	—	—
1	2	—	XI	—	—	—
6	15	2		4	12	—

(e) CASE FATALITY OF SMALLPOX.

uring the last two great epidemics (the first from 1896 to 1899 and the second 919 to 1920) the case fatality was as follows : in 1896, 18.98 per cent in the rural s and 23.22 per cent in the urban communes ; in 1897, 16.58 per cent in the istricts and 28.46 per cent in the towns. During the epidemic of 1919-1920, se fatality for this disease was 28.75 per cent. To-day it is only 7.4 per cent.

(f) ANTI-SMALLPOX VACCINATION.

ccination against smallpox was introduced into the Roumanian principalities, rticularly into Muntenia (Wallachia), towards 1832 ; at that time it was only ed in a number of well-to-do families at Bucharest and in the provinces.
1835, the Quarantine Committee decided that Jennerian vaccination con- l an important preventive measure and recommanded that this method should lied throughout the country. The first step taken in this direction was the of the reigning Prince, Alexander Ghika, dated April 16th, 1835. In 1875, t health law made vaccination compulsory. Since then, vaccination and revac- n have been strictly carried out in the first few months after birth, on entering mentary schools and on enlistment in the army. In addition, as soon as a ox centre is observed, the entire local population is subjected to compulsory nation.
ti-smallpox vaccine is prepared in the three following institutes : Institute Faculty of Veterinary Medicine at Bucharest ; Dr. Minculesco's Anti-Smallpox te at Bucharest ; Dr. Pascutzin's Anti-Smallpox Institute at Cluj.
e vaccine used is taken from the heifer ; its virulence is reinforced at the est Veterinary Institute by being passed through young buffaloes.

(g) STATISTICS OF VACCINATION AND REVACCINATION FROM 1898 TO 1924.

Year	Communes	Live Births	Vaccination		Revaccination	
			With Result	Without Result	With Result	Wit Res
1898	Rural	178,199	232,886	17,860	193,226	70,(
	Urban	36,781	43,888	1,485	39,286	10,3
	Total	214,980	124,549	19,265	232,512	80,3
1899	Rural	108,285	193,845	18,686	175,040	79,(
	Urban	32,431	39,404	1,574	41,839	13,7
	Total	140,716	233,249	20,260	216,879	92,3
1900	Rural	198,138	189,921	14,006	169,043	87,
	Urban	36,705	36,397	1,012	34,872	11,
	Total	234,843	226,318	15,018	203,915	99,
1901	Rural	205,073	178,379	10,745	140,936	75,
	Urban	35,631	34,825	981	34,850	10,
	Total	240,704	213,204	11,726	175,786	86,
1902	Rural	205,590	173,453	14,679	148,337	65,
	Urban	36,294	32,135	1,010	31,814	10,
	Total	241,884	205,588	15,689	180,151	75
1903	Rural	216,711	178,671	12,581	145,449	70
	Urban	35,531	30,926	759	29,411	8
	Total	252,242	209,597	13,340	174,860	78
1904	Rural	219,997	186,512	9,531	220,455	76
	Urban	36,180	32,385	1,028	42,383	10
	Total	256,177	218,897	10,559	262,838	86
1905	Rural	213,101	182,241	9,643	187,936	7
	Urban	34,858	31,388	516	30,372	1(
	Total	247,959	213,629	10,159	218,308	8
1906	Rural	226,215	176,207	13,415	179,867	8
	Urban	36,223	29,918	623	29,259	
	Total	262,438	206,125	14,038	209,126	9

Communes	Live Births	Vaccination With Result	Vaccination Without Result	Revaccination With Result	Revaccination Without Result
Rural	236,904	194,814	10,416	158,716	66,459
Urban	37,583	32,028	548	30,494	7,014
Total	274,487	226,842	11,004	189,210	73,473
Rural	234,519	188,467	10,010	145,056	51,314
Urban	38,331	30,945	1,338	33,068	10,353
Total	272,850	219,412	11,348	178,124	61,667
Rural	243,939	180,824	13,120	136,596	53,799
Urban	38,403	31,417	1,223	32,626	10,498
Total	282,342	212,241	14,343	169,222	64,297
Rural	234,450	198,835	12,235	161,446	51,823
Urban	38,656	35,105	625	36,224	10,989
Total	273,106	233,940	12,860	197,670	62,812
Rural	259,640	201,769	14,762	146,607	45,779
Urban	40,230	31,839	1,315	31,145	10,738
Total	299,870	233,608	16,077	177,752	56,517
Rural	271,352	220,796	15,623	169,543	49,018
Urban	42,738	35,797	1,187	36,227	12,948
Total	314,090	256,593	16,810	205,770	61,966
Rural	268,023	198,002	15,178	145,945	46,530
Urban	41,602	39,951	618	40,173	14,533
Total	309,625	230,953	15,796	186,118	61,063
Rural	327,345	257,309	13,117	220,336	61,514
Urban	44,921	38,278	1,395	49,102	14,423
Total	372,266	295,587	14,512	269,438	75,937
Rural	274,894	191,446	10,942	215,616	56,097
Urban	44,650	38,641	1,862	79,382	19,989
Total	319,544	230,087	12,804	294,998	76,086
Rural	248,478	285,025	28,587	771,487	180,985
Urban	37,101	38,722	1,040	362,003	71,461
Total	285,579	323,747	29,627	1,133,490	252,446

Year	Commune	Live Births	Vaccination With Result	Vaccination Without Result	Revaccination With Result	Revaccination Witho Resu
1920	Rural	221,451	221,997	33,819	416,398	130,5
	Urban	37,308	29,683	3,714	91,412	37,8
	Total	258,759	251,680	37,533	507,810	168,3
1921	Rural	221,451	188,852	36,219	258,988	115,3
	Urban	37,308	34,784	4,632	59,695	26,5
	Total	258,759	223,636	40,851	318,683	141,8
1922	Rural	255,478	216,784	30,277	223,928	93,7
	Urban	43,768	37,797	1,883	52,386	23,4
	Total	299,246	254,581	32,160	276,314	117,
1923	Rural	433,281	376,623	79,586	334,593	149,
	Urban	55,416	44,754	7,533	50,045	21,
	Total	488,697	421,377	87,119	384,638	170,
1924	Rural	442,001	425,556	53,293	355,594	134,
	Urban	44,633	38,294	2,675	41,753	18,
	Total	486,634	463,850	55,968	397,347	152,

If these figures are compared with those of the birth rate, it will be seen that tically all individuals are vaccinated in Roumania.

2. *Encephalilis Lethargica.*

(a) ENCEPHALITIS LETHARGICA IN GENERAL.

In 1925, 38 cases of encephalitis lethargica occurred, with 19 deaths ; th fatality would therefore appear to be 50 per cent. These figures are undou far from corresponding to the reality, the attention of the health officers havin recently been drawn to this disease. It is certain that only the most serious have been notified.

A questionnaire regarding encephalitis lethargica has recently been circ to doctors, who must now notify each new case.

(b) POST-VACCINAL ENCEPHALITIS.

Cases of this disease have not hitherto been observed in any of the seven d which have sent in their results. In view of the regularity with which the v tion of infants is carried out, it is probable that cases similar to those obse England, the Netherlands and Switzerland would not have escaped the atten doctors.

'uberculosis.

The decision that 10 per cent of the beds of the hospitals should be reserved uberculosis cases and form a separate section in each hospital has not yet been ied. Anti-tuberculosis vaccination with Professor Calmette's B.C.G. vaccine is nning to be employed, notably at Bucharest. A growing number of provincial ors are applying to the Serological Institute at Bucharest for this vaccine. erto, no accident has been noted ; a certain number of accurate observations onstrate the absolute efficacity of the method. Lectures have been organised arious important centres to bring to the notice of the public the great value of method.

Malaria.

During the year 1925, 164,262 cases of malaria were recorded ; 118,588 cases were ed with 1,535 kg. 932 gr. of quinine. A sum of 1,579,162 lei was spent on anti- ria measures. The experiments to ascertain the efficacity of the alkaloids of ne proposed by the Health Committee of the League of Nations have been carried at the hospitals for infectious diseases at Jassy and Galatz. In the infectious ses section of the Bucharest military hospital and in the Craiova hospital they shown that *quinelum* gives results comparable with and sometimes even superior ose of quinine. As regards the other alkaloids of cinchona, the salts of cinchonin been shown to be definitely more effective than the salts of quinine.

Furthermore, experiments have been made with *stovarsol* in different hospitals. s been used with satisfactory results in tertian fever, but it is very inferior to ne and completely ineffective in the other forms of malarial infection ; to-day, l be considered as the best arsenical auxiliary in the treatment of malaria.

The practice has grown up of systematically administering preventive doses of ne to the frontier guards and gendarmes of the malarial districts, particularly on outhern and eastern frontiers, which are specially exposed to inundations.

yphilis.

The total number of cases known to have been treated in 1925 was 6,319, for which 20 doses of neo-salvarsan were employed. One million lei were spent on the paign against syphilis, and the Bucharest Health Service has created ten new syphilis dispensaries in that town.

ellagra.

The statistics for 1925 having not yet been received, we shall confine ourselves ating the position in regard to this disease in 1924. There were 9,470 cases of gra observed in the rural districts and 157 in the towns. Persons over forty years e and women appear to be more liable to this disease than others.

It is interesting to note that, immediately after the war, the number of cases of gra appreciably diminished ; it was then thought that the disease would shortly pear, and, despite a temporary recrudescence, pellagra is, in fact, gradually asing throughout Roumanian territory. This phenomenon must be ascribed : o the use of bread, which since the war has been increasingly tending to replace iet of maize porridge among the peasants ; *(b)* to the considerable improvement e economic position of the peasants and consequently in their nourishment, o the expropriation law which has divided up the large estates for the benefit e peasants.

7. *Rabies.*

In 1925, the five anti-rabies institutes of the country treated the following num of persons bitten :

Bucharest	4,772
Cluj	2,193
Jassy	1,562
Cernauti	368
Chisinau	1,149
Total	10,044

VI. GENERAL PROBLEMS STUDIED IN 1926 BY ORDER OF THE HEALTH MINISTRY.

1. Efficacity of the alkaloids of cinchona.
2. Anti-tuberculosis vaccination of infants by Professor Calmette's method
3. Incidence of worm troubles among school-children.
4. Causes of the rarity of malaria in the Danube delta.
5. Incidence of trachoma among school-children.
6. Incidence and geographical distribution of goitre in Roumania.
7. Ætiology of scarlet fever and its specific treatment.
8. Post-vaccinal encephalitis.

KINGDOM OF THE SERBS, CROATS AND SLOVENES

BY

Dr. Ivo KUHN
(Belgrade)

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I. GENERAL INTRODUCTION.

rea.

48,989 square kilometers.

opulation.

2,017,323 inhabitants (census of January 31st, 1921).

udget.

I. ORDINARY EXPENDITURE.

	Dinars
inistry	2,280,480
epartmental Health Authorities	1,545,907
ealth Authorities in the "comitats" and districts	1,397,080
ate hospitals and other medical establishments	124,968,303
ublic baths	5,471,220
ygiene, social medicine, research work in infectious diseases and campaign against them	44,398,950
	190,161,940

II. EXTRAORDINARY EXPENDITURE.

	Dinars
inistry	72,630,346
ublic baths	25,250,000
	97,880,346

ne total expenditure of the Ministry of Health amounted to 288,042,286 dinars addition, the following supplementary credits provided for by special laws located in the course of the year 1925-26 (April 1st to March 31st) to the Ministry lth :

	Dinars
Administrative expenditure	6,000,000
Campaign against tuberculosis (establishment of dispensaries) ..	1,000,000
Subsidy to the Maternity and Infant Welfare Society ..	200,000
Subsidy to the Yugoslav Sports Club	70,000
Purchase of a bathing station	1,000,000
Completion of building of a lunatic asylum	2,000,000
Office expenses of the Ministry	247,000

this amount, 44,398,950 dinars were allocated exclusively to work in social ne and prophylaxis. For the payment of salaries, fees and cost-of-living bonuses 50 dinars were used. The remainder was allocated to outlay for materials, ws :

st of administration, outlay for the campaign against and cure of infectious s, and the foundation and maintenance of social health institutions.

I. *Serbia* (4,129,638 *inhabitants*).

	Dinars
se and production of anti-diphtheric sera and all other sera ..	350,000
se and production of all kinds of vaccines and animal lymphs ; ccination throughout the country	350,000

Purchase of novarsenobenzol and other preparations for the treatment of syphilis .. ..
Purchase of other productions for the prophylaxis and treatment of infectious diseases .. ..
Materials necessary for the campaign against malaria .. .. ..
Purchase of special remedies and appliances for the treatment of diseases of the eye .. ..
Purchase of disinfectants .. ..
Purchase of disinfecting apparatus and apparatus for bacteriological research .. ..
Purchase of huts, tents, linen, bedding, kitchen utensils, etc., for epidemic hospitals and ambulances .. ..
Cost of erection and upkeep of institutions for the study and prophylaxis of malaria ; buildings, equipment, instruments, apparatus and administrative expenses .. ..
Campaign against trachoma and upkeep of permanent trachoma hospitals and mobile dispensaries .. ..
Foundation and upkeep of tuberculosis dispensaries, and relief for necessitous patients .. ..
Foundation and upkeep of summer colonies for sickly children .. ..
Foundation and upkeep of bacteriological stations, Pasteur Institute, and permanent epidemic stations (Classes I, II and III) situated on the frontier .. ..
Upkeep of the mobile epidemic brigades, including motors and material
Credits to local and district health authorities for all necessary material for the campaign against infectious diseases .. ..
Foundation, construction and upkeep of travelling dispensaries, sanitary stations and temporary hospitals during epidemics ..
Upkeep of the institute for the preparation of sera and vaccines .. ..
Foundation and upkeep of public health institutions for combating venereal disease, tuberculosis, trachoma, infant mortality, etc. ..
Research work in social medicine, pathological racial geography, popular customs so far as they are connected with social medicine ; enquiry into popular conceptions in matters of health .. ..
Medical statistics .. ..
Popular instruction and publication of popular books, pamphlets and other means of propaganda ; campaign against alcoholism .. ..
Placards and pictures for purposes of health propaganda .. .. ..
Popular teaching, with all necessary equipment .. ..
Health exhibitions, etc., for popular instruction .. ..
Publication of the *Official Bulletin* and of a popular journal .. ..
Itinerant brigades for the purpose of circulating useful health propaganda among villagers .. ..

II. *Montenegro* (199,857 *inhabitants*).

Campaign against and treatment of all infectious diseases .. ..
Purchase of animal lymphs, vaccines, and sera .. ..
Free treatment of all patients suffering from infectious diseases, and free dispensing of medicines to all destitute patients .. .. ..
Establishment and upkeep of ambulances, dispensaries, bacteriological and epidemic stations and other similar institutions .. .. ..

III. *Bosnia and Herzegovina* (1,889,929 *inhabitants*).

	Dinars
tenance and establishment of stations, brigades and other institutions for the study and cure of infectious diseases	800,000
paign against alcoholism	100,000
enance and establishment of permanent and mobile bacteriological tations, production of sera and vaccines	500,000
paign against tuberculosis	600,000
aign against venereal disease	500,000
aign against malaria	500,000
aign against trachoma	150,000
.. ..	80,000
ep of medical trains	100,000
lling expenses and personal allowances	450,000
rch work in social medicine, medical statistics, lectures for soldiers, ublication of popular books and leaflets, permanent and itinerant xhibitions connected with matters of public health, and all other equirements for health propaganda	300,000

IV. *Dalmatia* (621,429 *inhabitants*).

p of bacteriological stations	150,000
p and establishment of disinfection stations	150,000
p and establishment of travelling dispensaries for supplying ee treatment during epidemics	100,000
ign against tuberculosis	500,000
ign against venereal disease..	300,000
ign against alcoholism	25,000
p of schools for the auxiliary medical staff needed for the campaign against epidemics	100,000
lactic vaccination and serum treatment	70,000
p of institute for the study and prevention of malaria in Trogir ..	2,600,000
nsation for persons who have forfeited their wages in consequence isolation during epidemics	20,000
ing expenses	150,000
ch work in social medicine, statistics, and popular instruction ..	25,000
ient and itinerant exhibitions	50,000
r lectures, lantern slides and cinematograph films	25,000
tion of popular books and leaflets	25,000

V. *Croatia and Slavonia* (2,739,593 *inhabitants*).

expenses of bacteriological stations, epidemic hospitals, the steur Institute, the institution for the production of animal mphs and other institutions for the study and cure of epidemics ..	500,000
and establishment of disinfection stations	500,000
and establishment of permanent and mobile bacteriological tions	500,000
gn against tuberculosis	500,000
e and manufacture of sera and vaccines	200,000
gn against venereal disease	500,000

Campaign against alcoholism .. ..
Campaign against trachoma .. ..
Campaign against malaria .. ..
Foundation and inauguration of an epidemiological institute 3,
Holiday camps .. ..
Campaign against scabies .. ..
Purchase of disinfectants .. ..
Travelling expenses incurred for the study of and campaign against epidemics, and medical aid .. ..
Upkeep of schools for the auxiliary medical staff needed for the campaign against epidemics .. ..
Upkeep of the Pasteur Institute .. ..
Upkeep of the institute for the production of animal lymphs .. ..
Research work in social medicine .. ..
Medical statistics .. ..
Lectures to soldiers, publication of pamphlets, leaflets, pictures, cinematographs, permanent and itinerant exhibitions .. .. ..

VI. *Slovenia* (1,056,464 *inhabitants*).

Upkeep and establishment of disinfection stations, purchase of vaccines and sera, smallpox vaccination, compensation to persons isolated, campaigns against tuberculosis, alcoholism, venereal disease, and trachoma, expenditure of the Pasteur Institute, equipment of a dispensary for tubercular patients and of the anti-venereal dispensaries, purchase of disinfectants and disinfecting apparatus, establishment and equipment of bacteriological laboratories, purchase of material for epidemiological research and the campaign against infectious diseases, travelling expenses incurred in the course of the campaign .. ..
Research work in social medicine, medical statistics, lectures for soldiers, publication of popular pamphlets, leaflets, books, cinematographs, permanent and itinerant exhibitions, subsidies to private enterprises .. ..

VII. *Banat, Bačka and Baranya* (1,380,413 *inhabitants*).

Office expenses .. ..
Heating and light .. ..
Rents .. ..
Campaigns against infant mortality, venereal disease, tuberculosis ; summer camps, open-air schools, crèches, disinfection stations ; campaign against trachoma, prophylactic vaccination and serum treatment, compensation to persons isolated ; purchase of medicaments and other material for the study and treatment of infectious diseases ; campaign against malaria ; purchase of various remedies against infectious diseases ; equipment and upkeep of schools for auxiliary health staff, including maintenance allowances for the staff ; institutions for the study and prevention of infectious diseases ; travelling expenses incurred for the study of and campaign against epidemics ; campaign against alcoholism .. .. ..

	Dinars
ch work in social medicine, medical statistics, lectures for ldiers, pictures, exhibitions, and all other means of popular struction	250,000

II. HEALTH LEGISLATION.

uniform law for the whole country has yet been passed, although a draft n in readiness for many years. Accordingly, as in the past, the health organi- of the various provinces has been carried out in pursuance of the old laws and ions. In the former provinces of Croatia and Slavonia, which were united ungary, the Health Code of 1896 remains in force.
Dalmatia, Slovenia and Bosnia, the regulations applicable in the old Austria In Voivodina (Batchka, Baranya and the Banat), certain regulations of the Kingdom of Hungary are still in force.
the case of Serbia and Montenegro, laws of 1881, with supplementary rules ulations dated 1903 and 1912, still prevail.
is variety of health laws and regulations is naturally, in many respects, not ve to progress.
e principal work of the Ministry of Health, upon its formation in 1919, was paration of certain minor laws, regulations and decrees for application throughout ntry.
this end, the following laws were introduced and enacted in 1921 in accordance ticle 130 of the Constitution :

1. Law concerning the organisation of a Ministry of Health ;
2. Law concerning the organisation of departmental health authorities ;
3. Law concerning the organisation of "comitat" and district health authorities ;
4. Law concerning the organisation of the Supreme Health Council ;
5. Law concerning medical specialists ;
6. Law concerning the service of doctors during epidemics ;
7. Law concerning the foundation of special institutions for the study and cure of infectious diseases, and free medical aid ;
8. Law concerning the establishment of a central pharmaceutical depot ;
9. Law concerning the Permanent Commission for Hospitals ;
10. Law concerning the Permanent Commission for Epidemics ;
11. Law concerning medical attendance in districts where there is a dearth of medical practitioners ;
12. Law concerning free medical aid in hospitals ;
13. Law concerning doctors' fees ;
14. Law concerning the establishment of new wards ;
15. Law concerning compulsory smallpox vaccination in Slovenia and Dalmatia ;
16. Law concerning the right to exercise the profession of midwife.

III. CAMPAIGN AGAINST INFECTIOUS DISEASES [1].

1. *Notification of Diseases.*

Since January 1st, 1925, the new regulation concerning the compulsor cation of infectious diseases has come into force. The following diseases are no

1. Cholera,
2. Plague,
3. Yellow fever,
4. Smallpox,
5. Typhus fever,
6. Relapsing fever,
7. Typhoid fever, enteric fever and paratyphoid,
8. Dysentery,
9. Scarlet fever,
10. Measles.
11. Diphtheria and croup,
12. Epidemic cerebro-spinal men
13. Encephalitis lethargica,
14. Whooping-cough,
15. Erysipelas,
16. Glanders,
17. Tetanus,
18. Anthrax,
19. Leprosy,
20. Malta fever,
21. Rabies.

Under the regulation, these diseases must be notified by the following :

1. All doctors (State, military, the autonomous authori private practitioners) ;
2. All medical institutions, including dispensaries, travellin saries, health insurance offices ;
3. All hospitals, it being stated in each case whether the pa received for treatment, was sent by a doctor, or came of his own
4. All persons in the public service, including hospital nu dren's nurses, midwives and disinfectors ;
5. All public officers, such as police, communal and revenue
6. All directors of establishments and institutions in which a large number of inmates or residents ;
7. All proprietors of hotels, boarding-houses and night-she

Notifications must be made upon the prescribed forms and sent to th Health Registrar or to the municipal public health office within twenty-f In the case of diseases dangerous to the public health, notification must b once. Notification can also be made verbally, but must be followed by declaration

The District Health Registrar or the municipal public health office m diately notify each case of cholera, plague or yellow fever, and the fi smallpox or scarlet fever, by telegram to the Ministry, the appropriate bact station, and the military authorities concerned.

Accurate particulars must be kept of notified cases. The notification sent in weekly direct by the District Health Registrar to the Ministry for purposes. At the Ministry all these data are collected, checked and publishe lar weekly reports on the infectious disease situation are prepared in French countries.

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[1] A table showing the number of cases, and of deaths caused by notifiable diseases reported in t the Serbs, Croats and Slovenes in 1925 is to be found in *Epidemiological Intelligence*, Vol. 10, page 13

ıe above regulation also authorise the Ministry to require notification of other s, such as tuberculosis, malaria, venereal disease, and other chronic and social s.

ıe work of notification in pursuance of this regulation was satisfactorily carried ing the past year, although the lack of doctors and transport difficulties proved es in certain places.

vertheless, it was shown that, out of 408 notification authorities, only a small age failed in the discharge of their duties.

tes of reminder from the central authorities were more frequent and numerous eginning, but decreased considerably in number during the course of the year. loctors became conscious of supervision and realised that systematic use was f the notifications they sent in.

infection.

addition to the final disinfection, great attention was paid to compulsory ion during the course of the disease. For this purpose a ministerial decree mulgated, under which all infected material from the patient's room is to be tically disinfected in all localities where there are qualified disinfectors (per- o had gone through a six-months training). This work was made compulsory to educate the people and teach them gradually and methodically to take ssary precautions of their own accord in the future.

doctors in the public services are responsible for the strict supervision of the the disinfectors. In places where epidemiological or bacteriological institu- ist, the work of disinfection is carried out by the services attached to these ons. Elsewhere, it is the duty of the district or municipal doctors to conduct ervise continual disinfection in the sick-room. A record is kept of the work d a monthly report is made to the bacteriological stations or to the Ministry. irtue of another decree issued in the same year, each bacteriological station emiological institution must be equipped with a permanent store of disin- These establishments must requisition the necessary supplies for this pur- n the respective pharmaceutical depots or purchase them at their own expense. 'Cyclon B " has recently been used to a large extent for disinfection, the issued regulations last year concerning the import, sale and use of this pro- nder these regulations, Cyclon B and all other preparations of hydrocyanic only be imported and sold by specially authorised and qualified persons. right to carry out disinfection with Cyclon B has been granted to the following:

1. Special establishments directed by competent persons ;
2. Persons who have been specially trained for this work.

regulations also contain provisions concerning the places in which Cyclon B stored.

der to train an adequate staff of disinfectors, six-months courses are held ar. In December 1925, the seventh disinfectors' course took place at Courses were also held at Zagreb and Ljubljana.

iological Stations.

campaign against diseases which appear sporadically or in epidemic form lly the work of the bacteriological stations and epidemiological and hygiene ıs. All these establishments are directed by doctors, equipped with modern and provided with one or two motor-vans.

dition to this work, these institutions undertook the preparation of Dick's

immunisation toxins, and in districts where typhoid fever appeared in form the population was vaccinated in large numbers with good results.

The number of bacteriological stations was increased last year by the of a new station at Strumica.

In addition, each bacteriological station keeps constantly in stock var and vaccines, which are supplied upon demand to all official and municipa and to hospitals for general use free of charge. A strict control is kept to the issue of excessive quantities of sera and vaccines. The bacteriological keep an exact account of the quantities of sera and vaccines requisitioned uses to which they are put.

As could be seen from the regulation concerning the notification of diseases, the bacteriological stations are responsible for adopting the measures in case of an epidemic.

Besides these epidemiological activities, the bacteriological stations ar sible for carrying on the study of certain diseases without special instruction

4. *Health Stations.*

The bacteriological stations ase helped in their work by the so-calle stations. At first, these organisations were merely occupied in the prev malaria; specimens of blood were collected for microscopic examination, an was dispensed free of charge. By degrees these auxiliary organisations ext sphere of their activities and were called upon to educate the people in healt and inculcate the fundamental principles of hygiene.

In 1925, several of these health stations were opened, principally in Serbia. They serve as first-aid centres, under the direction of a trained also as a source where the people can obtain the most necessary information health and sickness. In some places, baths have been installed at the station the public are admitted free. School-children are generally brought in b their teachers. Courses in household management and economy are also the co-operation of unofficial women's societies.

IV. HEALTH PROPAGANDA.

1. *Health Centres.*

There is no doubt that, without preliminary education, no useful w done in health matters. Defective sanitation, superstitions and unheal are the cause of a large number of illnesses and deaths. The sanitary e the people was therefore proceeded with very vigorously, and to this called " health centres " were established. It was thought that a model sanitary arrangements would serve as a valuable example for the villag health centres are both the point of departure and the basis for the im of public health. Stress must here be laid on the fact that they are imp only from the point of view of health but also from the point of view of gene they represent the peripheral bodies, the executives of the countr organisation. A trained nurse at one of these centres is not merely an the doctor in purely medical matters; she is also an instructress in do social life. At her house short courses are held in various branche knowledge, more especially for peasant girls between the ages of twelve a

ibitions, Lectures and Publications.

1925, greater attention was paid to the system of decentralisation in the matter
h propaganda. Experience has proved that this work is most successful if it
ed to the local circumstances and customs in each district. The various larger
establishments were therefore given a free hand in the matter. Numerous
with cinematograph films and lantern slides and the circulation of pamphlets,
lacards and leaflets, were arranged for. Travelling and permanent exhibitions
important part.

ermanent Malaria Exhibition was opened at the Institute of Tropical Medicine
je last year. This has been set up in a specially built hexagonal pavilion in
mediæval style. The material of the exhibition is as follows :

1. Information concerning malaria, propaganda, material for instruction.
2. State of the ground in malarial districts and geology of Southern Serbia.
3. Various kinds of malaria, mosquitoes, their development and biology.
4. Quinine preparations and other remedies.
5. Malaria and similar diseases.

her itinerant exhibition, called " Mother and Child ", went on tour through-
ear in the larger villages of Croatia and Slavonia. These exhibitions were
isited by the public, and lectures were also given.

Inspectorate at Sarajevo carried on active and successful propaganda in
ict during 1925 through its doctors, nurses and disinfectors. The Inspec-
d special stress upon instruction in matters concerning housing. Pictures
types of dwellings were distributed among the people for their instruction.
s, in the course of their visits, instructed the women in kitchen and house-
agement. This is especially important among the Mohammedan women,
access is difficult. The disinfectors instructed the people when they visited
l houses for the purpose of disinfection.

medical officers of health used every opportunity of giving short lectures,
the occasion of vaccination or of an autopsy, the inspection of schools, etc.
n, series of lectures were given at various institutions, with cinematograph
ntern slides. The subjects dealt with were : alcohol, infant care, natural
cial feeding of infants, maternity and child welfare, pregnancy, infectious
f children, enteric fever, smallpox, intestinal diseases, venereal disease,
is, hygiene for children.

ese questions are represented in 836 slides. In 1925, the Inspectorate
l 77,000 pamphlets, in which various special and general health questions
with. In addition, 5,000 copies of a booklet on holiday camps were printed.
manent Health Exhibition was established at Sarajevo and thrown open
lic free of charge. It was visited by more than 300 persons each month.
rmanent exhibitions on a smaller scale were opened in two other towns.
nt exhibitions were fitted out for anti-tuberculosis propaganda. These
sts, pictures, statistics, types of dwellings, and other material. The outfit
simply and handily packed, and can be transported to the smallest villages.
5, the Inspectorate employed a special travelling instructor in propaganda.
about with a small cinema apparatus, propaganda literature and slides.
ment with the school authorities, the Inspectorate has organised a so-called
ma in Sarajevo, at which cinematograph shows are arranged exclusively

for school-children. In the country, health propaganda is being carried on by of courses in domestic economy.

Equally active propaganda has been carried out by the Novi-Sad Insp in the Vojvodina and Syrmia districts. In this case, a large motor-car fitted electro-motor for working the cinematograph is used. In the town of N regular health conferences are held in a theatre. In addition to cinema shows and lantern slides, special plays dealing with various health questions a In the villages, lectures on health and sickness are given during Church festi fairs. A large number of placards, leaflets and pamphlets have also been dis by the Inspectorate, which has even prepared its own films and copied forei

The Inspectorate in Ljubljana also organised a permanent Health Ex last year and published a popular monthly review, *Health*. In addition to thi health courses for the general public are held at the Child Welfare Institute last one or two months, and are open free of charge to persons over the age of years. Both regular and casual hearers attend the lectures. Subjects dealt v general and physical hygiene, social hygiene (tuberculosis, venereal disease, alc hygiene for women and children, bacteriology, epidemiology, disinfection, d first aid, anatomy, physiology, and health legislation.

Special courses are organised for a minimum attendance of thirty. The u of this school is beyond doubt, as definite questions are systematically dealt explained.

The Institute of Social Medicine in Zagreb organises systematic lectu trated by films and slides, in Croatia and Slovenia. In addition to publishi lar pamphlets, it has circulated a large number of placards and leaflets a people. An itinerant Health Exhibition attached to this institute travels th the year from village to villa e. Films are made and duplicated at its ow

On the whole, it may be said that propaganda work during the past yea duced satisfactory results, judging by the large audiences attending the lec the popularity of the health exhibitions. It has been evident that the heal tions especially make a strong impression on the public.

Special mention should be made of three institutions, established which will prove a valuable help to the work of social medicine.

3. *Public Health Centres.*

From the outset, it was obvious that, if health conditions in the count be revolutionised, several larger centres were necessary for the direction a of the work. A village health station can only work successfully unde supervision, which can only be exercised by an establishment equipped w knowledge and experience of modern medicine. It was therefore decided t several headquarters for the centralisation of the general work of the various

In March 1925, therefore, a public health centre was opened at Novi an imposing building, with a large number of rooms of various sizes, inc offices of the Inspectorate, a dispensary for infants, infant tuberculosis an disease, an ambulance for trachoma, and a temperance restaurant. Spac been provided for a permanent health exhibition.

In April, the Institute of Tropical Medicine was formally opened a It serves as an administrative and technical centre for all the institute medicine in Southern Serbia. It comprises sections of bacteriology, ma sitology and chemistry. The first section deals with the prophylaxis, in and cure of all infectious diseases among human beings and animals, e caused by protozoa. There is a subsection for veterinary medicine.

leals with the investigation and cure of malaria and diseases caused by protozoa minths, and other exotic diseases. There is also a subsection for propaganda ther for the technique of sanitation. The third section is responsible for general parasitology and the fourth for medical chemistry.

e Institute also has a section for patients suffering from infectious diseases. equipped with several independent portable laboratories, the Institute can at e operate on the spot.

e Institute is technically self-supporting and is administratively under het ontrol of the Minister of Health.

November, a public health centre was opened in Peć (Ipek), an imposing build- d for dispensary work of all kinds. Under one roof are collected the school c, dispensaries for infants, tuberculosis and venereal disease, and a Röntgen ry for therapeutic purposes. Five to six thousand visits per month are regis- this institution, which is of special importance for the local population, whom health matters have been largely neglected for many years. This is ecially the case with the Mohammedan element, particularly the women. nen doctors working at the centre, however, have access to the Mohammedan

eed hardly be stated that medical aid at the centre is given free of charge. no need to emphasise the fact that the institutionn ot only does valuable the field of medicine but it constitutes an important centre for the general n and instruction of the people.

V. NURSING.

ccount of the importance of the nurse in the province of social medicine, a ol for nurses was opened last year at Novi-Sad. There are now five of these ns in the country. The syllabus and period of study are practically identical se schools. The school at Belgrade has the following syllabus :

professional subjects : history and geography of the country, principles of economy, general and health legislation, French or English language, type-

essional subjects : biology, physics, chemistry, anatomy, internal diseases, diseases, infectious diseases, pharmacognosy, surgery and orthopædics, and gynæcology, first aid, dietetics, diseases of the eye, ear, nose, throat, se, venereal disease, bacteriology and parasitology, epidemiology and pro- hygiene, social medicine, nursing.

practical courses last : for internal medicine and surgery, six months ; for diseases, obstetrics, infectious diseases, bacteriology and social medicine, hs ; for gynæcology, skin and venereal diseases, diseases of the eye, ear, nose t, and disinfection, one month.

inations are held each month. At the end of the fourth year the examina- ie diploma takes place.

st 1926.

SPAIN

BY

Dr. Julio ORENSANNZ

Of the Health Inspectorate

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ea.

5,207 square kilometers (including the Balearic Isles and the Canaries).

pulation.

) Total : 21,966,641 inhabitants (estimates for December 31st, 1924).

(b) POPULATION OF THE VARIOUS PROVINCES AND THEIR CAPITALS.

	Estimates as on December 31st, 1924			Estimates as on December 31st, 1924	
	Provinces	Capitals		Provinces	Capitals
.. .. ..	98,993	35,758	Logrono	193,412	28,930
.. .. ..	304,584	23,833	Lugo	472,750	32,155
.. .. ..	523,951	66,461	Madrid	1,122,587	783,216
.. .. ..	366,605	50,649	Malaga	559,215	156,513
.. .. ..	212,798	13,784	Murcia	654,739	147,785
.. .. ..	679,381	39,925	Navarre	331,824	32,899
Isles	345,061	79,136	Orense	415,403	17,947
a	1,392,848	738,498	Oviedo	770,541	72,264
.. .. ..	339,575	32,860	Palencia	193,109	20,541
.. .. ..	425,707	24,098	Pontevedra	550,770	27,835
.. .. ..	556,171	77,717	Salamanca	327,006	34,410
.. .. ..	498,516	63,904	Santander	340,111	77,663
.. .. ..	311,334	35,541	Segovia	170,592	16,176
eal	456,717	19,337	Seville	724,476	210,949
.. .. ..	585,978	77,861	Soria	153,942	7,780
.. .. ..	718,597	64,228	Tarragona	355,368	27,947
.. .. ..	290,416	13,265	Teruel	255,942	12,500
.. .. ..	334,318	18,241	Toledo	459,578	25,719
.. .. ..	587,479	105,835	Valencia	961,179	260,329
ura	205,084	14,024	Valladolid	283,301	77,797
a	274,129	68,527	Biscay	429,130	143,315
.. .. ..	353,955	38,949	Zamora	267,214	17,852
.. .. ..	251,890	14,013	Saragossa	507,045	148,268
.. .. ..	617,561	34,811			
.. .. ..	416,383	22,741	Total	21,966,641	4,205,286
.. .. ..	319,376	400,30			

3. *Birth Rate.*

(a) GENERAL RATE IN 1925.

Spain	Provinces	Capitals of Provinces	Provinces (ex Capitals
29.35	29.35	26.99	29.91

(b) RATE FROM 1900 TO 1924.

Year	Rate per 1,000 Inhabitants	Year	Rat Inh
1900	33.81	1913	
1901	34.85	1914	
1902	35.46	1915	
1903	36.19	1916	
1904	34.09	1917	
1905	34.93	1918	
1906	33.63	1919	
1907	33.20	1920	
1908	33.56	1921	
1909	32.95	1922	
1910	32.54	1923	
1911	31.40	1924	
1912	31.65		

(c) STILL-BIRTHS IN 1925 (RATE PER 100 BIRTHS).

Provinces	Capitals of Provinces	Provinces excluding Capitals)
2.90	5.68	2.28

NUMBER OF LIVE BIRTHS AND STILL-BIRTHS IN THE VARIOUS SPANISH PROVINCES IN 1925, CLASSIFIED ACCORDING TO SEX.

ovince	Live Births			Number of Live Births per 1,000 Inhabitants	Still-born			
	Male	Female	Total		Born Dead	Died during delivery	Died within 24 hours	Total
. .. ..	1,548	1,418	2,966	29.96	58	9	40	107
te	5,385	4,695	10,080	33.09	180	15	20	215
e	7,448	6,910	14,358	27.40	278	20	39	337
a	6,895	5,996	12,891	35.16	113	1	21	135
.. ..	3,828	3,594	7,422	34.88	129	13	40	182
z	10,769	10,055	20,824	30.65	417	12	36	465
c Isles ..	3,714	3,607	7,321	21.22	113	8	21	142
na	18,320	17,235	35,555	25.53	1,194	372	206	1,772
.. ..	5,651	5,603	11,254	33.14	172	55	113	340
.. ..	7,571	7,046	14,617	34.34	273	12	51	336
.. ..	8,669	7,794	16,463	29.60	762	30	67	859
s	6,862	6,291	13,153	26.38	313	14	99	426
n	3,642	3,366	7,008	22.51	141	4	50	195
Real ..	7,765	7,371	15,136	33.14	365	24	56	445
a	10,491	9,787	20,278	34.61	365	29	31	425
a	10,614	9,942	20,556	28.61	378	83	150	611
.. ..	4,790	4,444	9,234	31.80	58	6	40	104
.. ..	3,510	3,338	6,848	20.48	159	12	66	237
a	10,804	9,539	20,343	34.63	281	12	52	345
ajara ..	3,019	2,787	5,806	28.31	89	18	59	166
coa ..	3,915	3,579	7,494	27.34	207	27	60	294
.. ..	4,421	3,962	8,383	23.68	258	13	24	295
.. ..	3,205	2,987	6,192	24.58	53	16	37	106
.. ..	11,738	10,518	22,256	36.04	440	8	47	495
.. ..	7,225	6,787	14,012	33.65	184	61	131	376
.. ..	3,726	3,386	7,112	22.27	58	9	61	128
, ...	3,150	3,030	6,180	31.95	114	37	56	207
.. ..	6,087	5,662	11,749	24.85	143	56	107	306
.. ..	16,783	15,924	32,707	29.14	1,693	76	175	1,944
.. ..	10.144	8,559	18,703	33.45	596	20	25	641
.. ..	11,483	9,529	21,012	32,09	273	8	28	309
.. ..	4,871	4,598	9,469	28.54	128	64	57	249
.. ..	5,594	5,023	10,617	25.56	81	42	136	259
.. ..	11,359	10,272	21,631	28.07	516	69	113	698
.. ..	3,638	3,489	7,127	36.91	109	41	35	185
dra ..	7,616	7,231	14,847	26.96	216	48	103	367
ica ..	5,410	5,235	10,645	32.55	211	18	55	284
er	5,725	7,281	11,006	32.36	204	9	63	276
.. ..	2,954	2,795	5,749	33.70	81	19	39	139
.. ..	11,816	10,893	22,709	31.35	956	57	109	1,122
.. ..	2,300	2,208	4,508	29.28	97	29	57	183
na	3,369	3,223	6,592	18.55	163	9	17	189
.. ..	3,598	3,288	6,886	26.90	105	11	47	163
.. ..	7,622	7,306	14,928	32.48	228	19	36	283
id	12,660	11,980	24,640	25.64	369	35	90	494
.. ..	4,977	4,666	9,643	34.04	222	26	55	303
.. ..	6,554	6,387	12,941	30.16	322	41	100	463
a	4,229	3,944	8,173	30.59	94	20	73	187
.. ..	7,744	6,945	14,689	28.97	315	38	83	436
al	335,208	309,505	644,713	29.35	14,274	1,675	3,276	19,225

ality.

(*a*) GENERAL DEATH RATE IN 1925.

Spain	Provinces	Capitals of Provinces	Provinces (excluding Capitals)
19.78 in 1924)	19.67	21.66	19.20

(b) NUMBER OF DEATHS CLASSIFIED ACCORDING TO PRIN

Province	Typhoid fever	Typhus	Malarial fever and malarial cachexia	Smallpox	Measles	Scarlet fever	Whooping-cough	Diphtheria and croup	Influenza	Asiatic cholera	Cholera nostras	Other epidemic diseases	Pulmonary tuberculosis	Tuberculosis of the meninges	Other forms of tuberculosis	Cancer and other malignant tumours	Meningitis	Cerebral hemorrhage, apoplexy and
Alava	12	1	—	—	3	—	4	9	20	—	—	7	127	16	11	81	57	
Albacete ..	73	—	7	10	81	2	33	13	83	—	3	23	226	16	66	116	230	
Alicante ..	200	—	76	1	131	7	50	32	181	—	3	93	672	42	89	254	400	
Almeria	72	—	7	6	76	6	20	34	57	—	1	56	354	27	27	169	216	
Avila	37	—	11	—	10	3	31	12	74	—	1	20	177	19	46	172	165	
Badajoz ..	123	1	104	—	58	10	44	41	277	—	7	50	622	55	166	282	486	
Balearic Isles	46	—	2	—	3	1	4	14	40	—	—	5	365	24	34	225	102	
Barcelona ..	493	—	3	1	180	8	48	105	229	—	—	39	2,130	129	119	1,444	1,021	
Burgos	44	—	—	1	129	3	13	23	134	—	—	26	325	39	73	309	227	
Caceres	77	—	129	—	238	1	22	21	162	—	6	43	446	21	91	184	254	
Cadiz	111	—	90	131	59	2	37	21	116	—	—	28	1,038	78	114	314	443	
Canaries ..	60	—	3	—	146	1	80	64	99	—	3	86	537	52	37	271	355	
Castellon ..	58	—	1	—	226	2	19	26	65	—	1	17	324	24	40	187	119	
Ciudad Real ..	73	—	56	2	94	—	73	37	282	—	—	42	398	28	78	263	378	
Cordova ..	178	—	46	256	218	16	66	47	229	—	3	91	625	46	99	215	475	
Corunna ..	73	—	3	—	68	—	51	67	226	—	1	47	1,389	94	195	550	336	
Cuenca	67	—	5	—	79	1	20	18	142	—	3	41	151	18	46	140	214	
Gerona	88	—	2	—	36	2	9	8	85	—	5	8	407	31	52	228	112	
Granada	115	1	8	34	121	6	49	23	137	—	10	101	511	46	103	304	246	
Guadalajara ..	29	—	—	8	23	4	27	11	70	—	—	14	120	15	22	157	171	
Guipuzcoa ..	43	—	—	—	28	1	7	15	26	—	1	10	431	30	34	158	150	
Huelva	61	—	40	2	36	1	27	18	120	—	1	35	577	40	59	207	181	
Huesca	52	—	1	—	59	3	11	16	61	—	5	36	201	9	39	114	156	
Jaen	99	—	29	16	189	12	46	22	154	—	2	123	456	21	121	253	404	
Leon	64	—	10	—	34	2	96	81	140	—	8	16	429	44	93	272	309	
Lerida	77	—	2	—	74	—	10	19	47	—	1	21	264	13	31	194	149	
Logrono ..	42	—	—	—	60	1	13	13	47	—	8	14	186	23	39	142	149	
Lugo	20	—	—	1	29	1	55	17	103	—	—	9	637	13	64	277	112	
Madrid	162	2	13	26	179	28	108	54	291	—	5	50	2,137	286	234	1,095	1,066	
Malaga	142	—	24	285	148	3	48	36	177	—	12	84	898	52	89	333	464	
Murcia	186	2	42	11	134	5	56	47	144	—	—	74	736	66	85	344	396	
Navarre	47	—	—	—	56	—	21	27	93	—	4	26	323	35	78	261	216	
Orense	25	—	4	1	15	—	36	21	105	—	—	20	302	—	33	151	125	
Oviedo	52	—	1	—	54	1	66	45	178	—	1	16	1,335	123	181	453	402	
Palencia ..	27	1	5	2	48	—	16	20	81	—	2	9	195	18	49	150	183	
Pontevedra ..	45	—	4	—	19	5	48	27	99	—	—	16	881	72	94	405	218	
Salamanca ..	51	—	38	8	114	2	23	15	160	—	1	36	327	43	79	276	206	
Santander ..	36	—	—	2	47	1	12	19	116	—	5	11	622	105	87	263	204	
Segovia	16	—	2	1	21	7	19	9	68	—	2	11	109	18	27	127	142	
Seville	188	—	81	32	180	6	117	62	340	—	11	117	1,493	175	199	478	673	
Soria	34	—	1	10	49	—	25	5	69	—	—	12	94	9	29	138	116	
Tarragona ..	91	—	8	1	24	1	6	11	51	—	—	26	324	37	37	256	110	
Teruel	58	—	—	—	124	3	16	19	72	—	1	39	159	8	28	125	165	
Toledo	53	1	21	1	94	5	77	33	177	—	2	38	364	34	104	259	357	
Valencia	341	—	28	—	542	2	28	51	346	—	7	84	1,091	118	144	545	679	
Valladolid ..	25	—	5	—	99	14	22	19	116	—	1	28	331	34	86	285	235	
Biscay	33	—	—	1	109	2	18	22	45	—	1	16	768	111	80	280	289	
Zamora	44	—	9	1	46	3	27	15	81	—	1	16	229	23	87	228	153	
Saragossa ..	75	1	4	—	225	1	12	24	81	—	4	38	417	33	81	372	212	
Total ..	4,218	10	925	851	4,815	185	6	1,408	6,296	—	133	1,868	27,260	2,413	3,899	14,306	14,228	

S IN THE VARIOUS SPANISH PROVINCES IN 1925.

d International Nomenclature).

	Pneumonia	Other diseases of the respiratory system	Diseases of the stomach (excepting cancer)	Diarrhœa and enteritis (2 years and over)	Appendicitis and typhlitis	Hernia and intestinal obstructions	Cirrhosis of the liver	Nephritis and Bright's disease	Non-cancerous tumours and other diseases of the female genital organs	Puerperal septicæmia (fever peritonitis and puerperal phlebitis)	Other puerperal accidents	Congenital debility and malformations	Senility	Violent deaths (except Suicide)	Suicide	Other diseases	Diseases not specified or ill-defined	Total of deaths
2	57	130	25	202	2	8	24	50	3	5	6	76	80	35	3	288	67	1,894
6	97	354	49	970	14	28	63	170	1	38	18	333	528	64	18	1,232	122	6,428
4	182	827	91	709	5	88	88	290	9	50	15	332	685	141	28	1,936	113	10,076
2	106	486	44	883	7	36	49	161	1	34	28	321	535	82	22	1,278	96	6,624
1	82	300	36	633	12	31	44	120	3	14	15	218	223	60	10	962	140	4.735
5	189	636	83	2,486	13	87	101	251	11	56	25	791	795	189	6	2,458	299	13.437
1	122	251	42	139	6	44	51	164	11	11	10	91	417	73	16	1,024	130	4,920
4	139	523	106	1,022	6	47	86	212	7	29	23	327	390	129	17	1,269	441	7,745
2	205	572	69	1,592	6	69	84	206	8	42	29	513	411	116	12	1,649	490	9,668
7	191	1,093	76	1,555	4	60	105	332	9	43	32	339	397	219	1	2,367	214	11,739
0	250	539	31	1,594	6	15	53	226	4	31	12	295	539	100	5	1,311	361	8,253
5	84	417	55	374	8	46	67	211	4	13	11	213	436	68	23	1,240	44	6,140
6	171	638	82	1,696	13	63	52	190	3	29	26	419	393	125	24	1,719	139	9,812
3	279	999	147	1,949	22	73	69	266	7	62	26	523	516	131	37	2,419	261	12,869
1	261	772	125	911	14	90	76	270	17	38	41	487	1,249	206	11	1,915	301	13,060
7	115	379	72	885	7	35	64	168	4	13	24	328	441	80	12	1,252	133	6,373
9	175	392	13	213	4	49	84	139	1	5	19	62	139	117	19	946	197	5,371
8	271	803	117	1,646	21	83	70	329	10	47	34	451	614	153	42	2,547	227	11,693
4	47	264	53	411	7	38	55	114	4	16	10	190	289	55	20	746	234	4,213
8	168	432	46	183	5	33	38	202	3	13	5	92	114	119	2	786	246	4,381
5	110	379	35	600	12	41	45	181	2	23	16	247	356	95	25	1,033	62	6,042
6	61	354	32	495	9	35	51	157	3	25	18	77	234	72	20	1,065	95	4,718
9	227	1,143	102	2,222	17	76	84	362	9	54	38	560	505	137	25	2,864	284	13,896
6	243	723	105	1,035	12	57	52	212	8	25	38	315	455	184	5	1,337	252	8,796
5	111	367	51	278	6	32	45	175	4	22	5	122	341	107	11	953	60	5,163
9	77	357	23	437	7	27	44	155	6	20	15	165	207	69	17	779	64	4,147
5	407	530	119	414	7	40	39	230	7	22	41	438	1,042	128	5	986	274	8.32 0
4	499	2,306	241	1,975	72	204	245	855	28	86	49	852	760	356	29	4,052	167	23,533
6	256	738	79	1,614	14	57	61	283	6	56	28	417	757	125	31	2,492	242	12,269
8	234	809	79	1,559	8	72	97	316	5	74	21	470	652	152	28	2,469	249	12,368
5	111	508	65	512	9	46	83	192	4	27	16	196	239	120	9	1,102	186	6,051
0	260	549	100	616	10	47	71	203	11	14	17	255	402	56	2	1,236	261	7,293
4	382	993	52	954	22	63	69	376	10	53	16	281	779	237	22	2,179	521	12,719
3	95	323	74	888	8	29	51	129	5	25	5	194	164	67	—	806	173	4,825
0	140	729	139	675	4	47	72	241	3	22	13	239	528	135	7	1,504	331	9,300
5	145	593	52	1,058	8	56	62	209	1	28	18	292	322	71	24	1,463	136	7,541
3	139	555	49	491	11	36	53	183	3	23	11	126	147	116	2	995	202	5,929
3	243	1,185	102	2,397	30	103	140	363	9	80	33	598	727	209	8	3,011	79	16,861
4	64	221	31	392	3	21	32	103	2	22	11	145	240	41	12	665	130	3.446
5	106	420	34	243	19	39	76	207	4	11	10	83	252	124	24	1,107	79	5,538
3	86	472	59	430	5	43	48	168	9	17	7	238	354	79	19	1,013	264	5,370
4	149	589	74	1,286	13	50	88	198	6	35	23	459	453	111	27	1,749	230	9,112
8	291	1,708	119	1,360	23	166	168	503	13	62	47	518	812	203	25	3,710	146	18,599
1	82	419	72	1,111	8	41	51	195	6	26	16	235	238	86	11	1,126	137	6,576
3	313	997	70	421	11	35	64	179	8	19	13	212	199	212	3	1,052	378	7,399
5	98	295	54	775	1	31	49	159	5	23	7	171	280	115	1	937	442	5,916
	244	1,053	61	975	34	75	114	316	13	25	16	322	509	170	15	2,255	13	10,237
	9,247	33,238	3,655	47,478	623	2,795	3,720	11,960	328	1,570	991	15,097	21,732	6,398	763	79,032	10,467	43,2164

(c) NUMBER OF DEATHS CLASSIFIED ACCORDING TO SEX IN THE VARIOUS S
PROVINCES IN 1925.

Province	Male	Female	Total	Death Rate per 1,000 Inhabitants	Province	Male	Female	Total
Alava	977	917	1,894	19.13	Logrono ..	2,107	2,040	4,147
Albacete. ..	3,324	3,104	6,428	21.10	Lugo.	4,012	4,308	8,320
Alicante. ..	5,199	4,877	10,076	19.23	Madrid	12,444	11,089	23,533
Almeria . ..	3,431	3,193	6,624	18.07	Malaga	6,351	5,918	12,269
Avila.	2,432	2,303	4,735	22.25	Murcia	6,353	6,015	12,368
Badajoz . ..	7,091	6,346	13,437	19.78	Navarre. ..	3,123	2,928	6,051
Balearic Isles	2,428	2,492	4,920	14.26	Orense	3,619	3,674	7,293
Barcelona ..	14.257	13,040	27,297	19.60	Oviedo	6,296	6,423	12,719
Burgos	3,987	3,758	7,745	22.81	Palencia. ..	2,446	2,379	4,825
Caceres	5,041	4,627	9,668	22.71	Pontevedra .	4,426	4,874	9,300
Cadiz	6,259	5,480	11,739	21.11	Salamanca .	3,832	3,709	7,541
Canaries. ..	4,108	4,145	8,253	16.56	Santander ..	3,031	2,898	5,929
Castellon ..	3,224	2,916	6,140	19.72	Segovia.. ..	1,826	1,646	3,472
Ciudad Real	5,111	4,701	9,812	21.48	Seville	8,744	8,117	16,861
Cordova. ..	6,714	6,155	12,869	21.96	Soria.	1,753	1,693	3,446
Corunna. ..	6,144	6,916	13,060	18.17	Tarragona ..	2,878	2,660	5,538
Cuenca	3,322	3,051	6,373	21.94	Teruel	2,768	2,602	5,370
Gerona	2,816	2,555	5,371	16.07	Toledo	4,818	4,294	9,112
Granada. ..	5,982	5,711	11,693	19.90	Valencia. ..	9,526	9,073	18,599
Guadalajara.	2,272	1,941	4,213	20.54	Valladolid ..	3,383	3,193	6,576
Guipuzcoa ..	2,219	2,162	4,381	15.98	Biscay	3,861	3,538	7,399
Huelva	3,291	2,751	6,042	17.07	Zamora.. ..	2,976	2,940	5,916
Huesca	2,590	2,128	4,718	18.73	Saragossa ..	5,411	4,826	10,237
Jaen.	7,364	6,532	13,896	22.50	Total	222,682	209,482	432,164
Leon.	4,401	4,395	8,796	21.12				
Lerida	2,714	2,449	5,163	16.17				

5. *Infant Mortality.*

(a) MORTALITY FROM 0 TO 5 YEARS (RATE PER 1,000 DEATHS) IN 1925.

Spain	Provinces	Capitals of Provinces	Provinces (excluding Capitals)
342	342.77	285.45	359.09

NUMBER OF DEATHS CLASSIFIED ACCORDING TO AGE-GROUPS IN THE VARIOUS SPANISH PROVINCES IN 1925.

ovince	Deaths			Province	Deaths		
	0—1 year	1—4 years	0—4 years		0—1 year	1—4 years	0—4 years
.. .. ..	377	179	556	Logrono	894	625	1,519
e	1,523	1,165	2,688	Lugo	1,436	585	2,021
e	1,572	1,298	2,870	Madrid	4,901	2,880	7,781
.. ..	1,502	1,097	2,599	Malaga	2,619	2,206	4,825
.. .. ..	1,211	751	1,962	Murcia	2,660	2,151	4,811
.. ..	3,522	1,958	5,480	Navarre	1,064	757	1,821
Isles ..	433	240	673	Orense	1,458	626	2,084
ıa	3,308	2,414	5,722	Oviedo	2,119	1,256	3,375
.. ..	1,888	1,158	3,046	Palencia	1,314	866	2,180
.. .. ..	2,690	1,752	4,442	Pontevedra ..	1,539	937	2,476
.. ..	2,465	1,852	4,317	Salamanca ..	1,826	1,186	3,012
.. ..	2,508	1,415	3,923	Santander ..	1,176	587	1,763
n	822	908	1,730	Segovia	879	535	1,414
Real ..	2,828	1,448	4,276	Seville	3,964	2,656	6,620
.. ..	3,018	2,461	5,479	Soria	743	508	1,251
.. ..	2,301	1,337	3,638	Tarragona ..	530	322	852
.. ..	1,568	1,058	2,626	Teruel	971	846	1,817
.. ..	476	371	847	Toledo	2,225	1,662	3,887
.. ..	2,664	2,254	4,918	Valencia	2,801	3,080	5,881
jara ..	924	554	1,478	Valladolid ..	1,780	943	2,723
ɔa	608	389	997	Biscay	1,335	1,052	2,387
.. ..	1,079	653	1,732	Zamora	1,292	788	2,080
.. ..	772	660	1,432	Saragossa	1,973	1,522	3,495
.. ..	3,576	2,926	6,502				
.. ..	2,015	1,341	3,356	Total	87,764	60,714	148,478
.. ..	615	499	1,114				

6. *Budget.*

The budget for the period 1925 was the same as for the preceding year. Tr
and extraordinary credits made it possible to allocate large sums to the Public
Department for the execution of various schemes, the most important of wh
the following :

Cancer Institute : Equipment of new premises .. .. ..

Permanent Committee for the Campaign against Tuberculosis : Sanatoria at Humera and Valdelatas .. .. ..

Alfonso XIII Institute : Transformation of a ward into a laboratory for the Provincial Sanitary Brigade .. ..

Establishment of a physical and chemical research laboratory.. .. ..

Medical Stores Depot : Purchase of material .. .. ..

" Azua " Anti-Venereal Dispensary : Purchase of material, cost of installation, etc... .. ..

" Lago " Anti-Tubercular Sanatorium : Establishment of a surgical service, building of a ward, purchase of material and installation of water supply .. ..

King's Hospital, Madrid (for infectious diseases) : Purchase of furniture, instruments, etc. .. ..

Victoria-Eugenia Ward : Annex to the King's Hospital for the treatment of advanced cases of tuberculosis. .. ..

San José Home : Extensions and improvements .. .. ..

Princess Hospital : Building of wards, purchase of material, etc.

Prince of the Asturias College : School for doctors' infants ..

Rubio Institute (Madrid) : Purchase of material.. .. ..

Marine Sanatorium at Pedrosa (Santander) : Building of a ward

Marine Sanatorium, Malvarrosa (Valencia) .. .. ..

Sanitary Station, Ayamonte (Huelva) .. ..

II. INFECTIOUS DISEASES[1].

Mortality from Infectious Diseases in 1925.

Infectious diseases have caused deaths at the rate of 3.56 per cent in the c
taken as a whole, and of 4.62 per cent in the capitals of provinces.

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[1] A table showing the number of deaths caused by certain infectious diseases in Spain during 1925 is
Epidemiological Intelligence, No. 10, page 125.

NUMBER OF DEATHS FROM CERTAIN INFECTIOUS DISEASES AND MORTALITY RATE IN THE VARIOUS SPANISH PROVINCES IN 1925

Province	Typhoid fever	Typhus	Smallpox	Measles	Scarlet fever	Whooping-cough	Diphtheria
.. ..	12	1	—	3	—	4	9
.. ..	73	—	10	81	2	33	13
.. ..	200	—	1	131	7	50	32
.. ..	72	—	6	76	6	20	34
.. ..	37	—	—	10	3	31	12
.. ..	123	1	—	58	10	44	41
les..	46	—	—	3	1	4	14
.. ..	493	—	1	180	8	48	105
.. ..	44	—	1	129	3	13	23
.. ..	77	—	—	238	1	22	21
.. ..	111	—	131	59	2	37	21
.. ..	60	—	—	146	1	80	64
.. ..	58	—	—	226	2	19	26
al	73	—	2	94	—	73	37
.. ..	178	—	256	218	16	66	47
.. ..	73	—	—	68	—	51	67
.. ..	67	—	—	79	1	20	18
.. ..	88	—	—	36	2	9	8
ra	115	1	34	121	6	49	23
.. ..	29	—	8	23	4	27	11
.. ..	43	—	—	28	1	7	15
.. ..	61	—	2	36	1	27	18
.. ..	52	—	—	59	3	11	16
.. ..	99	—	16	189	12	46	22
.. ..	64	—	—	34	2	96	81
.. ..	77	—	—	74	—	10	19
.. ..	42	—	—	60	1	13	13
.. ..	20	—	1	29	1	55	17
.. ..	162	2	26	179	28	108	54
.. ..	142	—	285	148	3	48	36
.. ..	186	2	11	134	5	56	47
.. ..	47	—	—	56	—	21	27
.. ..	25	—	1	15	—	36	21
.. ..	52	—	—	54	1	66	45
.. ..	27	1	2	48	—	16	20
a	45	—	—	19	5	48	27
.. ..	51	—	8	114	2	23	15
.. ..	36	—	2	47	1	12	19
.. ..	16	—	1	21	7	19	9
.. ..	188	—	32	180	6	117	62
.. ..	34	—	10	49	—	25	5
.. ..	91	—	1	24	1	6	11
.. ..	58	—	—	124	3	16	19
.. ..	53	1	1	94	5	77	33
.. ..	341	—	—	542	2	28	51
.. ..	25	—	—	99	14	22	19
.. ..	33	—	1	109	2	18	22
.. ..	44	—	1	46	3	27	15
.. ..	75	1	—	225	1	12	24
Total	4,218	10	851	4,815	185	1,766	1,408

(a) NUMBER OF DEATHS FROM CERTAIN INFECTIOUS DISEASES AND MORTALIT IN THE VARIOUS SPANISH PROVINCES IN 1925 *(continued)*.

Province	Influenza	Tuberculosis			Meningitis	Pneumonia	Puerperal septicæmia	Totals
		Pulmonary	Meninges	Other forms				
Alava	20	127	16	11	57	57	5	322
Albacete	83	226	16	66	230	97	38	968
Alicante	181	672	42	89	400	182	50	2,037
Almeria	57	354	27	27	216	106	34	1,035
Avila	74	177	19	46	165	82	14	670
Badajoz	277	622	55	166	486	189	56	2,128
Balearic Isles	40	365	24	34	102	122	11	766
Barcelona	229	2,130	129	119	1,021	731	55	5,249
Burgos	134	325	39	73	227	139	29	1,179
Caceres	162	446	21	91	254	205	42	1,580
Cadiz	116	1,038	78	114	443	191	43	2,384
Canaries	99	537	52	37	355	250	31	1,712
Castellon	65	324	24	40	119	84	13	1,000
Ciudad Real	282	398	28	78	378	171	29	1,643
Cordova	229	625	46	99	475	279	62	2,596
Corunna	226	1,389	94	195	336	261	38	2,798
Cuenca	142	151	18	46	214	115	13	884
Gerona	85	407	31	52	112	175	5	1,010
Granada	137	511	46	103	246	271	47	1,710
Guadalajara	70	120	15	22	171	47	16	563
Guipuzcoa	26	431	30	34	150	168	13	946
Huelva	120	577	40	59	181	110	23	1,255
Huesca	61	201	9	39	156	61	25	693
Jaen	154	456	21	121	404	327	54	1,921
Leon	140	429	44	93	309	243	25	1,560
Lerida	47	264	13	31	149	111	22	817
Logrono	47	186	23	39	149	77	20	670
Lugo	103	637	13	64	112	407	22	1,481
Madrid	291	2,137	286	234	1,066	499	86	5,158
Malaga	177	898	52	89	464	256	56	2,654
Murcia	144	736	66	85	396	234	74	2,176
Navarre	93	323	35	78	216	111	27	1,034
Orense	105	302	—	33	125	260	14	937
Oviedo	178	1,335	123	181	402	382	53	2,872
Palencia	81	195	18	49	183	95	25	760
Pontevedra	99	881	72	94	218	140	22	1,670
Salamanca	160	327	43	79	206	145	28	1,201
Santander	116	622	105	87	204	139	23	1,413
Segovia	68	109	18	27	142	52	7	496
Seville	340	1,493	175	199	673	243	80	3,788
Soria	69	94	9	29	116	64	22	526
Tarragona	51	324	37	37	110	106	11	810
Teruel	72	159	8	28	165	86	17	755
Toledo	177	364	34	104	357	149	35	1,484
Valencia	346	1,091	118	144	679	291	62	3,695
Valladolid	116	331	34	86	235	82	26	1,089
Biscay	45	768	111	80	289	313	19	1,810
Zamora	81	229	23	87	153	98	23	830
Saragossa	81	417	33	81	212	244	25	1,431
Total	6,296	27,260	2,413	3,899	14,228	9,247	1,570	78,166

NUMBER OF DEATHS FROM CERTAIN INFECTIOUS DISEASES AND MORTALITY RATE IN THE VARIOUS CAPITALS OF THE SPANISH PROVINCES IN 1925.

apitals of Provinces	Typhoid fever	Typhus	Smallpox	Measles	Scarlet fever	Whooping-cough	Diphtheria
. .. .	7	1	—	—	—	3	1
. .. .	7	—	3	—	2	3	2
. .. .	24	—	—	1	—	1	2
. .. .	20	—	1	—	1	5	6
. .. .	2	—	—	—	1	—	—
. .. .	3	—	—	—	—	—	1
sles	13	—	—	—	—	—	2
l	168	—	—	106	3	18	73
. .. .	4	—	—	12	—	—	1
.. ..	4	—	—	10	—	4	1
. .. .	4	—	8	6	—	6	3
. .. .	1	—	—	8	—	12	5
. .. .	4	—	—	68	1	2	6
eal	5	—	—	2	—	—	2
. .. .	35	—	120	28	5	15	11
.. ..	11	—	—	15	—	1	9
.. ..	3	—	—	2	—	—	1
.. ..	7	—	—	2	—	1	—
ıra	20	—	18	10	—	—	3
a	2	—	—	4	—	—	—
.. ..	10	—	—	1	1	2	5
.. ..	8	—	—	6	—	7	3
.. ..	2	—	—	12	1	—	—
.. ..	8	—	—	26	—	3	1
.. ..	8	—	—	6	—	1	2
.. ..	7	—	—	8	—	—	4
.. ..	7	—	—	3	—	—	1
.. ..	—	—	—	1	—	5	—
.. ..	92	—	17	81	16	68	30
.. ..	26	—	190	54	2	11	13
.. ..	61	1	—	65	2	10	7
.. ..	4	—	—	11	—	1	3
.. ..	3	—	—	1	—	1	—
.. ..	14	—	—	14	—	6	9
. .. .	—	—	—	11	—	—	—
a	3	—	—	—	—	2	1
a	6	—	1	11	—	4	2
.. ..	9	—	—	12	—	2	4
.. ..	2	—	—	1	—	—	—
.. ..	73	—	1	16	3	34	29
.. ..	1	—	—	13	—	—	—
.. ..	13	—	—	1	—	—	1
.. ..	18	—	—	12	2	1	1
.. ..	7	—	—	—	—	2	4
.. ..	106	—	—	45	2	3	15
.. ..	5	—	—	9	13	3	9
.. ..	12	—	—	60	1	8	6
.. ..	2	—	—	1	—	—	—
.. ..	39	1	—	48	1	—	6
otal	890	3	359	803	57	245	285

(b) NUMBER OF DEATHS FROM CERTAIN INFECTIOUS DISEASES AND MORTALIT
IN THE VARIOUS CAPITALS OF SPANISH PROVINCES IN 1925 *(continued)*

Capitals of Provinces	Influenza	Tuberculosis			Meningitis	Pneumonia	Puerperal septicæmia	Totals
		Pulmonary	Meninges	Other Forms				
Alava.. ..	2	67	9	6	24	31	1	152
Albacete. ..	5	40	3	7	51	15	4	142
Alicante. ..	19	102	11	9	50	37	5	261
Almeria. ..	5	96	2	4	28	23	2	193
Avila. ..	2	25	2	3	13	7	—	55
Badajoz. ..	18	65	11	14	40	21	1	174
Balearic Isles	1	79	3	7	33	36	2	176
Barcelona. ..	71	1,288	33	45	681	466	25	2,977
Burgos. ..	5	59	3	16	14	8	3	125
Caceres. ..	6	28	5	3	18	6	—	85
Cadiz	8	243	25	30	82	16	5	436
Canaries. ..	—	93	10	5	49	32	1	216
Castellon. ..	4	75	9	4	39	11	—	223
Ciudad Real.	7	38	3	9	29	9	1	103
Cordova. ..	5	142	11	13	62	67	9	523
Corunna. ..	17	208	25	29	65	14	2	396
Cuenca. ..	1	11	3	5	8	5	—	39
Gerona. ..	2	77	4	9	6	15	—	123
Granada. ..	13	149	19	32	40	54	7	365
Guadalajara.	6	16	6	1	14	5	1	55
Guipuzcoa ..	—	155	6	9	40	44	6	279
Huelva. ..	8	118	12	16	32	10	5	225
Huesca. ..	4	19	—	3	16	7	3	67
Jaen.	10	44	2	10	36	13	6	159
Leon.	3	49	6	6	31	19	4	135
Lerida	2	41	3	3	27	9	1	105
Logrono. ..	9	55	14	10	26	8	2	135
Lugo.	4	75	2	9	8	21	4	129
Madrid. ..	149	1,603	208	151	666	362	67	3,510
Malaga. ..	36	415	24	31	149	113	15	1,079
Murcia. ..	27	189	11	20	105	60	18	576
Navarre. ..	6	87	14	18	36	17	2	199
Orense. ..	2	41	—	3	23	4	—	78
Oviedo. ..	10	215	36	27	52	29	6	418
Palencia. ..	3	43	4	18	32	8	3	122
Pontevedra	3	59	6	6	18	4	—	102
Salamanca..	14	57	11	8	34	22	3	173
Santander ..	13	204	49	26	51	36	4	410
Segovia. ..	9	22	1	3	13	5	—	56
Seville. ..	94	680	102	75	224	93	24	1,448
Soria	3	16	—	1	16	3	1	54
Tarragona ..	1	28	3	1	16	3	1	68
Teruel.. ..	5	16	1	2	5	2	1	66
Toledo. ..	15	56	7	12	25	8	3	139
Valencia. ..	96	380	51	36	186	114	9	1,043
Valladolid ..	40	178	18	36	56	35	5	407
Biscay. ..	7	386	54	36	91	105	9	775
Zamora. ..	5	31	11	16	24	11	1	102
Saragossa. ..	19	210	19	39	65	92	7	546
Total. ..	794	8,373	872	882	3,449	2,135	279	19,426

III. RECENT REFORMS IN HEALTH ORGANISATION.

ıtional School of Hygiene.

national school of hygiene was established in 1925 for the training of doctors
Public Health Service. At present it serves only this purpose, but will
tely include three sections :

1. A course of technical training for medical officers in the Public Health Services ;
2. A course of technical training for the subordinate staff (non-certificated practitioners, inspectors, disinfectors) of the Public Health Service ;
3. An advanced course for doctors, chemists, veterinary surgeons, engineers, chemists and architects.

ıe school curriculum is at present divided into two parts : a preparatory course advanced course.

Preparatory course :

General and special bacteriology ;
Epidemiology (with clinic of infectious diseases) ;
Parasitology ;
General hygiene ;
Disinfection ;
Statistics, health engineering and architecture.

Advanced course :

Industrial hygiene ;
School hygiene ;
Mental hygiene ;
Child welfare ;
Phthisiology ;
Social and venereal hygiene ;
Alcoholism ;
Insurance ;
Physical culture.

.e preparatory course also includes some rudimentary knowledge of the analysis stuffs, of zoology and marine hygiene (in harbours and on board vessels). museum will in due course be attached to the school.
present, the courses are held at the Alfonso XIII Institute of Hygiene and King's Hospital. Twelve pupils recruited by competitive examination have tered and will be appointed to posts in the health administrations on completing udies.

lional School of Puericulture.

is school was established by a Royal Decree dated November 17th, 1925, education of women and the protection of children from birth to adolescence.

A course for certificated nurses and visiting nurses is now being organi
is open only to girls who have taken their matriculation or an elementary t
certificate. Courses for doctors and schoolmasters who wish to specialise will
organised and certificates will be awarded to successful students.

A model farm is to be attached to the school for supplying the dispensa
infant welfare centres. The school curriculum includes five courses :

(a) Pre-natal puericulture ;
(b) Hygiene of the first two stages of infancy ;
(c) Hygiene of the third stage of infancy and school hygiene ;
(d) Laboratories, and technical training of visiting nurses ;
(e) Odontology.

These courses will be open to medical students, law students, dental s
and mothers (pregnant women, nursing mothers and mothers of older ch

The organisation and distribution of relief for mothers and children i
consideration.

3. *Public Health Committee.*

This institution, created by a Royal Decree dated March 31st, 1925, is un
immediate authority of the Director-General of Public Health, and is resp
for the sanitary inspection of establishments affording medical and pharma
assistance in return for the payment of a premium or a subscription. The Con
must satisfy itself that these establishments afford the necessary guarantees
fulfilment of the obligations they assume towards their members. They n
registered at the offices of the Committee, which will see that the necessary cor
are fulfilled. The Committee will be composed of representatives of the State, c
sickness insurance associations and their branches. Special regulations will lay

(a) The nature of the services to be rendered by sickness in
associations to their members, and the material necessary ;
(b) The minimum subscription for members ;
(c) The minimum fees for doctors ;
(d) The maximum number of insured persons and of the mem
their families which may be treated by each doctor.

4. *Institute for the Control of Sera, Vaccines, Medicaments, etc.*

This institute, established by a Royal Decree dated December 22nd, 19
include three sections :

(a) Serology, inspection of sera and vaccines ;
(b) Pharmaceutical physiology, study of reagents for diagnost
of opotherapic products ;
(c) Chemical analyses, inspection of pharmaceutical specialiti
of milk substitutes.

The cost of the establishment and organisation of this institute will be cove
the fees for the inscription and registration of pharmaceutical specialities up
amount of 200,000 pesetas.

The sums required for the salaries of the staff of the institute will be take
the fines inflicted for infringements of the law or for false declarations. In ad
a small tax on pharmaceutical specialities and a higher tax on foreign specialit
be levied for that purpose.

upervision of Dentistry.

. Royal Decree dated March 21st, 1925, provides for the appointment of an :tor of dentistry in each capital of a province (two at Madrid and Barcelona) by irector-General of Public Health, upon the nomination of the electoral colleges. inspectors will act under the orders of the provincial health inspector, and will mbers of the Provincial Dentists' Committees. Their duties will be to establish ster of dentists, to examine their certificates and to inspect the dental clinics ental apparatus workshops. Their rights and prerogatives will be the same as of deputy directors of public health of the three following branches : Medicine, iacy and Veterinary Surgery, and their salaries will be fixed at the same rate. egional dental colleges, similar to those already existing for doctors, and governed e same regulations, are to be established.

IV. HEALTH LEGISLATION.

rovincial Health Regulations.

hese Regulations are the natural corollary to the Municipal Health Regulations ped in the *Year-Book* for 1924, and provide for the co-ordination of the provincial services and for a superior hierarchical organisation invested with powers of ive for the establishment of curative institutions, sanatoria, etc. It also es for a centralisation of the services of laboratories for the manufacture or ation of sera and vaccines, disinfecting plant, etc. We give a brief analysis se Regulations below.

) *Health Authorities.*—The Civil Governors, assisted by the provincial tors and committees, will devote their fullest attention and energy to health ons.

he provincial inspectorate has been retained and is under the direction of the cial inspector, who has full authority in the matter of general and special health ons, such as, for example, the hospitals and sanitary institutions in the provinces. s also the right to inflict certain penalties.

) *Provincial Health Committees.*—These Committees will immediately draw up tions determining the status of their members and defining their powers. They sponsible for the supervision of all health work done in the communes and pro- . They also act as an advisory body and exercise supervision. The regulations list of the persons who must be members of the committees and permit the tion of various sub-committees, of which the provincial inspector must be a er.

) *Provincial Health Institutes.*—The Boards of Deputies are responsible for tablishment of health institutes, which will include the sanitary brigades where exist. The existing situation will be taken into account. The provincial institute will be under the immediate authority of the provincial health tor, whether he is its director or not. The Boards of Deputies are entitled to new posts, including those of assistant directors of the institute.

ppointments to these posts will be made on the results of competitive exami- s for which the Boards of Deputies will fix the rules.

Where no sanitary brigade exists, the institute will be organised to carry work as effectively as possible.

The provincial inspector will in all cases make whatever use of the various l of the institute be thinks best.

Each institute will comprise at least three sections :

1. The epidemiological and disinfecting section, which will carry on the ca against endemics and epidemics. In districts which include malarial zones work with the central Committees.

2. The analysis section, which will analyse foodstuffs, beverages, medi and industrial products.

3. The vaccine section, which will carry on more especially the campaign rabies, smallpox and typhoid fever, and will, if possible, extend its activities infectious diseases. The provincial health institutes will submit a monthly re their work and will maintain scientific relations with similar institutions such Alfonso XIII Health Institute, and with the delegations of the Red Cross S for the transport of the injured and sick.

Courses of health propaganda and advanced courses for municipal ins will be instituted.

The powers of the provincial inspector in regard to the institute will be la in detail, whether he is its director or not. The sanitary sub-brigades will, be sible to the institute, though they will retain their own special organisation Boards of Deputies will be responsible for forming sub-brigades in localities none exist. When appointing the staff of these sub-brigades, preference given to persons who have acquired a knowledge of hygiene, more especially to s of the National School of Hygiene.

Municipalities with more than 10,000 inhabitants will be exempt from of 1 per cent levied for the maintenance of the institute. They will, howe operate with it under the direction of the provincial inspector. The forma an inter-provincial union of communes for this purpose will be authorised.

A Royal Decree dated March 23rd, 1926, deals with the case of Boards seem dilatory in the matter of creating health institutes.

(d) *Health Regulations in Provincial Hospitals.*—Each hospital must an isolation ward for infectious diseases, a complete disinfecting apparatus, apa installations provided by the Boards, an X-ray cabinet and special rooms treatment of prostitutes.

Each provincial hospital must equip a special ward for tubercular pa Detailed regulations have been laid down for the technical and administrative w of these hospitals.

(e) *Social Health Institutions. Dispensaries.*—The Provinces must organ consultations for general diseases, but more especially for persons predispo tuberculosis and those suffering from tubercular or venereal diseases. These tations will be given by medical experts in premises equipped for the purpose. regulations have been laid down for the working of the anti-tubercular dispe which must in no case be used for other patients. A service for medical atte at the patients' homes, the inspection of dwellings and the observation of p will be organised.

The anti-venereal dispensaries will, upon request, assist any male or applicant and will make every effort to sterilise germ-carriers.

'hey will work in close contact with similar institutions, such as the "Azua" Dispen-and the "Lago" Sanatorium, etc.
n districts where trachoma and leprosy are prevalent, special dispensaries will eated.

Sanatoria.—Boards of Deputies which are not in a position to maintain anti-cular sanatoria out of their own funds will combine for the purpose with other ls, or will send their patients to the establishments of Boards which possess on payment of the hospital fees.
Colonies for sick or delicate children will also be organised.

f) *Puericulture.*—All Boards must organise maternity and puericulture insti-each of these will comprise at least three sections : a refectory for pregnant n and nursing mothers, an infant welfare centre and crèches. They will have y qualified staff and will be under the supervision of the provincial inspector. provincial inspector will also exercise supervision over the professional wet-s. The Regulations contain a reminder to Civil Governors that the care of sick en should be one of their main concerns.

Mental Hygiene.

By a Royal Decree dated July 28th, 1925, a commission was appointed with ctions to propose, within a maximum period of three months, the most effective s of organising the care of the insane and instruction in psychiatrics.
'his Commission has submitted a scheme which the Ministry proposes to put xecution as soon as it has the necessary financial means at its disposal.

elief for Indigent Doctors.

Royal Decree dated June 26th, 1925, lays down that all charitable institutions the authority of the general Directorate of Public Health shall, upon request, free of charge, as "distinguished guests" all doctors provided that they have sed their profession and are without means.

ugust 1926.

SWEDEN

BY

Dr. Charles LUNDBERG

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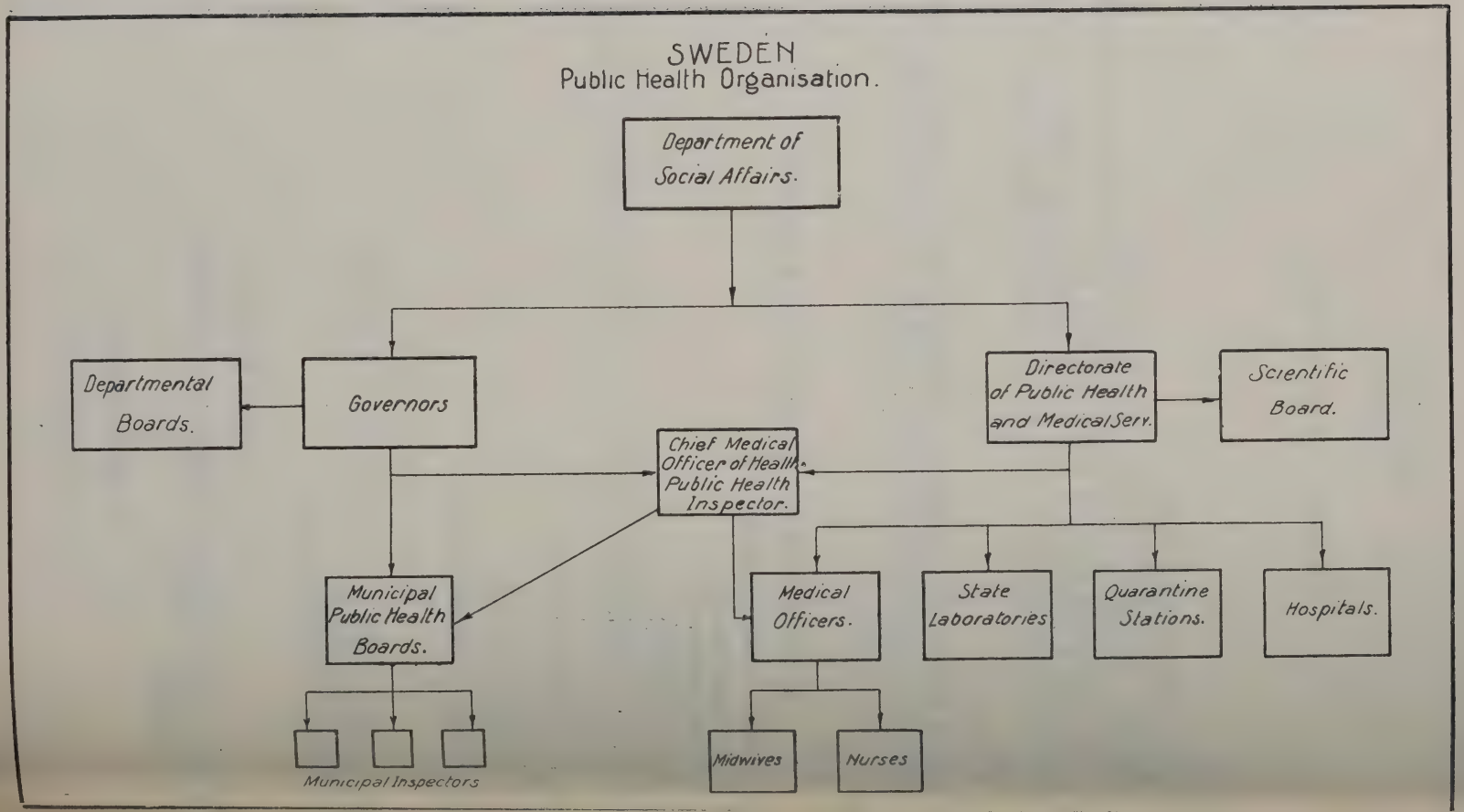
SWEDEN
Public Health Organisation.
Department of Social Affairs.
Departmental Boards.
Governors
Directorate of Public Health and Medical Serv.
Scientific Board.
Chief Medical Officer of Health Public Health Inspector.
Municipal Public Health Boards.
Medical Officers.
State Laboratories
Quarantine Stations.
Hospitals.
Municipal Inspectors
Midwives
Nurses

I. GENERAL INTRODUCTION.

3,459 square kilometers.

ılation.

ıuary 1st, 1925 : Country, 4,186,216 ; towns, 1,849,902 ; total, 6,036,118.

ality.

(a) General Mortality in 1924.

	Number of deaths	Rate per 1,000 inhabitants
	71,991	11.96
Country	51,980	12.42
Towns	20,011	10.90

(b) Mortality by Age-Groups and by Sex in 1920.

	Age (Years) 0-1	1-2	2-3	3-5	5-10	10-15	15-20
.. ..	5,055	813	408	601	973	773	1,201
ex	3,726	699	422	540	940	753	1,162

	20-30	30-40	40-50	50-60	60-70	70 and over	Total
.. .. ..	3,191	2,286	2,283	3,152	4,939	3,032	38,707
ex	2,485	2,333	2,268	3,037	5,046	16,010	39,421

[*(c) See inset between pagee* 470 *and* 471.]

(d) GEOGRAPHICAL DISTRIBUTION OF GENERAL MORTALITY IN 1924.

Provinces	Number of deaths	Rate per 1,000 inhabitants
Stockholm (Town)	4,902	11.3
Stockholm (Province)	2,821	11.0
Upsala (Province)	1,732	12.4
Södermanland (Province)	2,160	11.2
Östergötland (Province)	3,633	11.7
Jönköping (Province)	2,711	11.8
Kronoberg (Province)	1,999	12.6
Kalmar (Province)	2,942	12.7
Gotland (Province)..	864	15.2
Blekinge (Province)	1,997	13.4
Kristianstad (Province)	2 904	11.9
Malmöhus (Province)	5,465	11.0
Halland (Province)..	1,868	12.5
Göteborg and Bohus (Province) ..	4,770	11.1
Älfsborg (Province)	3,662	12.2
Skaraborg (Province)	3,114	12.6
Vermland (Province)	3,297	12.2
Örebro (Province)	2,476	11.1
Västmanland (Province)	1,933	11.6
Kopparberg (Province)	3,093	12.1
Gäfleborg (Province)	3,232	11.8
Västernorrland (Province) ..	3,698	13.6
Jämtland (Province)	1,780	13.1
Västerbotten (Province)	2,363	12.3
Norrbotten (Province)	2,367	12.5

(e) DISTRIBUTION OF GENERAL MORTALITY ACCORDING TO SEASONS IN 19

	Male sex	Female sex	Total
Winter	10,551	11,003	21,554
Spring	11,350	11,471	22,821
Summer	8,566	8,530	17,096
Autumn	8,240	8,417	16,657

4. *Birth Rate.*

		Live births	Rate per 1,000 inhabitants	Still-births	Nu stil per 1,
1920	Legitimate.. ..	116,946	19.90	2,573	
	Illegitimate ..	21,807	3.71	653	
1924 [1]	Legitimate.. ..	93,753	15.58	2,713	
	Illegitimate ..	15,256	2.53		

[1] Provisional figures.

Principal causes of death	sex ears)							Total for both sexes
	20-30	30-40	40-50	50-60	60-70	70 and upwards	Total	
of new-born and malforma	—	—	—	—	—	—	1,591	3,848
cay	—	—	—	4	139	6,795	6,938	12,013
l accidents	143	153	53	—	—	—	368	368
s diseases	1,653	1,240	735	534	457	403	8,221	16,477
of the blood	14	22	36	63	52	16	252	455
.. ..	36	29	42	54	88	66	391	757
ntoxication	—	2	—	1	—	—	3	31
of the nervous system, etc	37	64	103	249	620	1,632	2,929	5,396
.. ..	12	14	17	16	16	27	106	211
of the circulatory organs	112	194	279	516	1,148	3,068	5,534	10,547
of the respiratory organs	128	146	157	286	643	1,437	4,047	8,145
of the digestive organs .	97	100	141	187	232	284	1,612	3,395
of the genito-urinary orga	75	110	128	148	223	239	1,016	2,489
of the joints and bones .	15	9	9	30	49	72	430	881
ases	1	1	—	—	—	12	19	36
.. ..	48	143	442	779	1,110	1,326	3,881	7,126
eaths, suicides, homicides	71	63	56	67	76	164	678	2,112
or ill-defined causes of d	43	43	60	103	195	469	1,405	2,841
Total	2,485	2,333	2,268	3,037	5,046	16,010	39,421	77,128

(c) Mortality according to Principal Causes of Death and Age-Groups in 1920.

Principal causes of death	Male sex														Female sex														Total for both sexes
	Age (years)														Age (years)														
	0-1	1-2	2-3	3-5	5-10	10-15	15-20	20-30	30-40	40-50	50-60	60-70	70 and upwards	Total	0-1	1-2	2-3	3-5	5-10	10-15	15-20	20-30	30-40	40-50	50-60	60-70	70 and upwards	Total	
...es of new-born and malformation ..	2,212	30	10	—	3	2	—	—	—	—	—	—	—	2,257	1,560	18	8	3	2	—	—	—	—	—	—	—	—	1,591	3,848
...decay	—	—	—	—	—	—	—	—	—	—	4	80	4,991	5,075	—	—	—	—	—	—	—	—	—	—	4	139	6,795	6,938	12,013
...peral accidents	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	19	143	153	53	—	—	—	368	368
...tious diseases	647	320	206	319	541	351	683	1,995	1,138	726	555	455	320	8,256	569	304	213	313	566	429	805	1,653	1,240	735	534	457	403	8,221	16,477
...ses of the blood	8	1	1	6	10	7	7	16	15	33	45	40	14	203	6	1	1	8	7	10	6	14	22	36	63	52	16	252	455
...lexia	1	—	1	11	9	31	23	44	30	32	48	58	78	366	2	3	2	4	16	30	19	36	29	42	54	88	66	391	757
...nic intoxication	—	—	—	—	—	—	—	—	4	7	8	8	1	28	—	—	—	—	—	—	—	—	2	—	1	—	—	3	31
...ses of the nervous system, etc ..	65	17	14	23	37	46	48	82	81	120	271	520	1,143	2,467	46	25	12	17	42	41	41	37	64	103	249	620	1,632	2,929	5,396
...entia	—	—	—	—	1	1	4	7	25	27	17	12	11	105	—	—	—	—	1	1	2	12	14	17	16	16	27	106	211
...ses of the circulatory organs ..	1	2	—	17	59	52	68	118	150	198	465	1,047	2,836	5,013	1	1	3	14	59	69	70	112	194	279	516	1,148	3,068	5,534	10,547
...ses of the respiratory organs ..	915	219	65	79	80	60	71	209	166	227	316	607	1,084	4,098	691	179	99	83	102	47	49	128	146	157	286	643	1,437	4,047	8,145
...ses of the digestive organs	516	44	12	28	28	36	64	109	101	152	191	244	256	1,783	345	47	15	27	46	46	45	97	100	141	187	232	284	1,612	3,395
...ses of the genito-urinary organs ..	7	7	6	9	21	22	24	69	67	125	209	339	568	1,473	6	3	8	6	24	17	29	75	110	128	148	223	239	1,016	2,489
...ses of the joints and bones	186	76	15	8	20	11	19	13	12	12	12	35	32	451	136	42	11	9	11	15	13	15	9	9	30	49	72	430	881
...diseases	4	2	—	—	—	—	1	—	—	1	3	—	6	17	4	1	—	—	—	—	—	1	1	—	—	—	12	19	36
...mours	2	3	5	6	6	15	15	35	90	245	626	1,102	1,095	3,245	4	3	4	2	—	5	15	48	143	442	779	1,110	1,326	3,881	7,126
...ent deaths, suicides, homicides ..	47	44	47	53	115	114	155	445	357	322	293	226	216	1,434	41	24	19	24	27	20	28	71	63	56	67	76	164	678	2,112
...known or ill-defined causes of death ..	444	48	26	42	43	25	19	49	48	56	89	166	381	1,436	315	39	27	30	37	23	21	43	43	60	103	195	469	1,405	2,841
Total	5,055	813	408	601	973	773	1,201	3,191	2,286	2,283	3,152	4,939	13,032	38,707	3,726	699	422	540	940	753	1,162	2,485	2,333	2,268	3,037	5,046	16,010	39,421	77,128

nt Mortality.

NFANT MORTALITY ACCORDING TO PRINCIPAL CAUSES OF DEATH IN 1920.

Principal causes of death	Legitimate		Illegitimate	
	Male sex	Female sex	Male sex	Female sex
ations and infant diseases ..	1,691	1,242	521	318
us diseases	531	449	116	120
of the blood	7	5	1	1
a	1	2	–	–
of the nervous system	50	36	15	10
of the circulatory organs ..	1	1	–	–
of the respiratory organs ..	740	558	175	133
of the digestive organs ..	408	272	108	73
of the genito-urinary organs ..	5	4	2	2
of the joints and bones	148	107	38	29
ases	2	2	2	2
s	2	3	–	1
leaths, homicides	20	17	27	24
n or ill-defined causes of death ..	362	241	82	74
Total	3,968	2,939	1,087	787
Towns	971	726	453	319
Country	2,997	2,213	634	486
	6,907		1,874	
er of deaths per 100 live births :	5.90		8.59	

) DISTRIBUTION OF INFANT MORTALITY ACCORDING TO SEASONS IN 1920.

	Male sex	Female sex	Total	%
ter	1,396	1,028	2,424	27.60
ng	1,482	1,118	2,600	29.61
mer	1,136	822	1,958	22.29
umn	1,041	758	1,799	20.50

(c) Infant Mortality by Age-Groups in 1920.

Age	Male sex	Female sex	Total
First week	1,357	929	2,286
Second week	351	247	598
Third week	276	207	483
Fourth week	206	138	344
1– 2 months	562	411	973
2– 3 ,, ...	416	311	727
3– 4 ,, ...	322	229	551
4– 5 ,, ...	268	218	486
5– 6 ,, ...	263	191	454
6– 7 ,, ...	208	170	378
7– 8 ,, ...	192	150	342
8– 9 ,, ...	181	165	346
9–10 ,, ...	153	121	274
10–11 ,, ...	137	128	265
11–12 ,, ...	163	111	274
Total	5,055	3,726	8,781
12–15 months	310	267	577
15–18 ,, ...	215	169	384
18–21 ,, ...	167	161	328
21–24 ,, ...	121	102	223
	813	699	1,512

6. *Budgets.*

A. State Budget for 1925-26.

Balance-sheet totals of receipts and expenditure 728

Items of particular interest :

(a) Army Medical Service (exclusive of pay) .. .. ..
(b) Navy Medical Service (exclusive of pay) .. .. ..
(c) Anti-alcoho campaign .. ..
(d) Medical Corps and Health and Medical Services 2

This item includes notably :

	Crowns
Directorate of the State Health and Medical Services	379,200
State medical establishments	183,040
Corps of District Medical Officers	2,040,700
Establishments for the mentally afflicted ..	11,379,740
Leper institutions	32,000
Appropriation for the erection of tuberculosis sanatoria	325,000
Appropriation for the erection of hospitals for contagious diseases	1,590,000
Appropriation for the upkeep of tuberculosis sanatoria	3,000,000

	Crowns
Appropriation for the upkeep of hospitals for contagious diseases	1,000,000
Appropriation for anti-tuberculosis dispensaries	350,000
Institutions for the infirm	409,000

	Crowns
General hygiene	2,445,989

This item includes notably :

General health and medical services (approximately 500 crowns of this sum being for the campaign against venereal diseases) ..	890,000
Allowances to district nurses (training courses, scholarships, etc.)	209,000
Allowances to district midwives	810,000
Training of midwives and lying-in hospitals ..	89,203
Vaccination against smallpox	290,000
Improvement of the medical services in the sparsely populated districts of the north ..	107,000

Universities, medical training, etc.	5,721,741

This item includes notably :

The University of Upsala	1,976,425
The University of Lund	1,953,073
The Carolus Institute of Medicine and Surgery	882,480

The Universities also possess considerable private funds.

ıcial Budgets.

expenditure of the provinces : 61,153,999 crowns, of which 31,665,679, r cent of the total, are allocated to the provincial health and medical services.

sum of 31,665,679 crowns is distributed as follows :

	Crowns
ral hospitals, etc.	19,282,482
)aign against tuberculosis	5,207,675
)aign against epidemic diseases	3,695,842
of the mentally afflicted	1,648,785
of the infirm	471,095

II. ORGANISATION OF THE HEALTH SERVICES.

Department of Social Affairs.

hird section of this department deals with all matters relating to general nedical services (except where such matters come within the province of lepartment), quarantine services, pharmacies, the training of midwives atters connected with the exercise of their profession, as also the technical f the civil medical staff.

1. *Central Health Administration.*

Board of State Health and Medical Services.

The Board of State Health and Medical Services exercises general su over the public health of the country, subject to certain special regulations to the army and navy, and deals with all questions which have reference to th and veterinary organisation of the country.

This Board consists of a Director-General and of six members, who a of the following sections : the Medical Section, the Hygiene Section, the Section, the Lunatic Asylum Section, the Veterinary Section and the S Accountancy Section.

The subjects which come within the province of these sections are the fo

Medical Section.—The practice of medicine, medical district and civilian officers not attached to hospitals, forensic medicine (except questions comin the field of psychiatry).

Hygiene Section.—Public hygiene, contagious diseases, vaccination, e hospitals, quarantine establishments and certain Government medical establi

General Section.—District hospitals, sanatoria, anti-tuberculosis and othe establishments not controlled by other sections, pharmacies, the sale of d the registration of the staff working under the Board (with the exception of v surgeons).

Lunatic Asylums Section.—Organisation of lunatic asylums (except fo which come within the province of the Staff and Accountancy Section), ca mentally deranged and of idiots, questions of forensic medicine coming within of psychiatry, inebriates' homes (so far as they are under the control of th

Veterinary Section.—Matters relating to the appointment of civil or veterinary surgeons, measures against epizootic diseases of domestic inspection of meat in slaughter-houses, veterinary quarantine establishm State veterinary bacteriological establishments, registration of veterinary

Staff and Accountancy Section.—The financial administration of the ments for the management of which the Board is responsible, collection payments, the keeping and auditing of accounts, and all matters connected organisation and staff of the Board.

The following organisations are placed under the control of the Board Health and Medical Services :

(a) THE STATE LABORATORIES (BACTERIOLOGICAL LABORATORY, LABORA OF FORENSIC MEDICINE, PHARMACEUTICAL LABORATORY, VETERINAR BACTERIOLOGICAL LABORATORY).

Government Bacteriological Laboratory. — The staff of this laboratory of a director holding the rank of professor and appointed by the Governm laboratory workers, two assistants, one veterinary assistant, etc. There i inspector to supervise the laboratory, the production of sera in Sweden

The duties of the Government Bacteriological Laboratory, which wo the control of the Board of State Health and Medical Services, are as follo requested by the Board, to undertake bacteriological investigations in s cases, whenever an epidemic is to be feared or has broken out, or when

tions are considered necessary ; to manufacture the bacteriological sub-
hich are used for diagnoses or for therapeutical purposes ; to carry out all
riological work of the medical services and to prepare animal vaccines.
scientists attached to the laboratory must be free to engage in individual
work, and the same freedom should, so far as possible, be allowed to other
gists.

(b) QUARANTINE STATIONS.

e stations are two in number : the Fejan station, near Stockholm, and the
ation, near Gothenburg. Their purpose is to prevent contagious diseases
oduced into the country, as required by existing international conventions.
o stations are provided with the equipment and premises necessary for the
on of ships, the observation of suspicious cases and the accommodation
ts.
cessary, observation stations can be set up in the minor sea ports.

(c) STATE HOSPITALS.

lic Asylums.—At the present moment they number 17, with 10,530 beds.
has taken over the lunatic asylums of the two largest cities of the kingdom :
n and Gothenburg. An inspector of the Board of State Health and Medical
s specially entrusted with the supervision of these asylums and all other
nents for the mentally deranged and idiots.

Hospital.—There is a hospital with 26 beds for the treatment and isolation
The number of lepers in Sweden is 33, 16 of whom are treated in this

(d) DOCTORS AND MEDICAL STAFF.

edical Officers.

ppointed by the State.—There is one *Chief Medical Officer* (Health In-
or each province, and 261 *District Medical Officers*, to which should be
ertain number of supernumerary District Medical Officers who are appointed
te and by the provinces and communes. The District Medical Officers' main
sist in giving medical treatment to the rural population and in ensuring
rance of sanitary rules and regulations. They are required to adhere to
of fees laid down by the State.
e majority of towns have medical officers *(Town Medical Officers)* appointed
their duties are roughly similar to those of the District Medical Officers.

urses and Midwives: see below under the heading " Provincial Councils "

ISORY ORGANISATION ATTACHED TO THE CENTRAL HEALTH ADMINISTRATION.

the object of assisting the Board of State Health and Medical Services,
nment has appointed a Council of Scientists consisting of 14 members,
ng the following branches : psychiatry, forensic medicine, hygiene, pharma-
ience, law, ophthalmiatrics, medicine, surgery, obstetrics, dental surgery,
echnique for hospitals, syphilidology.

2. *Provincial Health Authorities.*

(a) GOVERNORS.

The Governors of the provinces exercise general supervision over health in their provinces. A Provincial Medical Officer appointed by the State is to each Governor in an advisory capacity. In the large cities it is the Town Officer appointed by the town who carries out these duties.

All these medical officers also act as public health inspectors and as in of certain medical establishments in their respective districts.

(b) PROVINCIAL COUNCILS.

The main business of the Provincial Councils is to look after the sick and Most of the *hospitals* and *infirmaries* are owned and managed by them. Provincial Councils have also founded *special establishments for chronic diseases* in conjunction with their hospitals.

In order to combat *tuberculosis*, the Provincial Councils have erected an culosis sanatoria which are maintained with State support. Like the Sta have granted subsidies to sea-side sanatoria and other establishments for s children; they have also promoted and organised the work of dispensaries. sum allocated by the Provincial Councils for the purpose of combating tub amounted, in 1925, to 4 ½ million crowns.

Under the Law of 1919, the *work of combaling epidemic diseases*, which left to the communes, was handed over to the provinces, which were granted subsidy. This substitution of the Provincial Councils for the communes will b completed by the beginning of 1933 ; at the present moment, 120 fever hosp already under the management of the Provincial Councils and the subsidies for that purpose to these councils amounted, in 1925, to approximately 5 crowns. Treatment in hospitals for contagious diseases is given free of ch

Midwives.—Matters relating to midwives, which were formerly dealt wi by the communes, are now largely dealt with by the Provincial Councils. T the Provincial Councils and the communes are all concerned in the appoin midwives.

District Nurses.—The Royal Decree of April 30th, 1920, contains provisi respect to Government subsidies granted for the institution of district nurses these provisions, a (non-urban) commune and—if the area concerned is a w vince—a Provincial Council may appoint district nurses. Generally speak Provincial Councils also grant subsidies to the nurses appointed by the co The total of the subsidies allocated for this purpose by the Provincial amounts, at the present moment, to approximately 400,000 crowns per In 1925, the districts numbered 587, of which 366 only were provided with District nurses must hold a certificate issued by a nurses' training college a by the State ; their principal duties are to attend patients at home and information as to the care of children, hygiene of the home, and general

Extensive work is also done by the Provincial Councils in *caring for the d* Thus the protection and care of idiots is nowadays dealt with almost ent the provinces ; the Government gives subsidies for the purpose. All P Councils now have schools for *idiots*, and frequently asylums for untrainal

ial establishments. The subsidies granted by Provincial Councils for the n and care of idiots amounted, in 1925, to approximately 1,300,000 crowns. ım should be added the amounts allowed for the care of the mentally deranged to be admitted to the provincial hospitals or to special establishments owing :k of accommodation in State asylums. The contribution of the provinces :his expenditure amounts to about 500,000 crowns per annum.
provincial councils also grant considerable subsidies for the *infirm and the* d have recently taken in hand the education of the *deaf-and-dumb*.

ipal Health Administration.

commune should have a *Health Council*, appointed by it ; this Council a control over the health conditions of the commune by means of special rs and, in some cases, house and food inspectors. In the small communes ies can be carried out by one and the same person. If the commune possesses officer (District or Town Medical Officer), he is *ex officio* a member of the

III. CURATIVE MEDICINE.

ss recently made in the Organisation of Hospitals.

See Tables I and II following.

TABLE I.—HEALTH ESTABLISHMENTS IN SWEDEN IN 1924.

Establishments	Number	Number of beds	Patients admitted	Deaths	Expenditure (in crowns)
ospitals	92	13,307	168,053	8,206	32,246,577
es (with a maximum of 24	76	1,221	16,432	764	2,566,151
attached to asylums ..	24	3,965	7,673	1,863	4,656,261
ospitals and private nursing s	24	687	8,288	224	1,264,141
hospitals	14	943	8,045	502	1,554,337
anatoria	6	802	1,851	43	1,284,139
for contagious diseases..	242	6,777	17,901	489	4,617,549
erculosis shments State	4	466	974	47	1,071.191
shments Province ..	64	5,156	10,677	1,613	10,460,810
shments Private.. ..	7	346	708	61	919,841
hospitals	22	712	20,201	123	1,134,785
for incurables	19	1,081	902	368	1,249,917
and lunatic asylums be- ng to the State	17	10.530	2,532	473	16,436,114
nents for cripples (medical n)	3	172	1,250	3	371,161
per Institutions	1	34	1	1	26,240

TABLE II. — INCOME AND ALLOWANCES OF HEALTH ESTABLISHMENTS IN S
IN 1924.

Establishments	Receipts			
	Fees paid by patients	Allowances		
		State	Provinces	Com
	Crowns	Crowns	Crowns	Cr
General hospitals	8,362,211	964,786	16,534,770	5,95
Infirmaries (with maximum of 24 beds)	537,254	4,721	1,879,879	10
Hospitals attached to asylums	34,806	—	83,523	4,01
Private hospitals and private nursing-homes	547,864	—	42,378	
Children's hospitals	257,866	—	9,547	66
Seaside sanatoria	277,713	400,261	—	54
Hospitals for contagious diseases	182,838	934,790	1,709,293	1,77
Anti-tuberculosis establishments: State ..	782,483	288,040	—	
Anti-tuberculosis establishments: Province .	1,924,720	2,566,030	3,802,495	2,02
Anti-tuberculosis establishments: Private ..	725,193	34,847	7,834	
Lying-in hospitals	524,193	—	—	45
Asylums for incurables ..	642,454	—	134,938	5
Hospitals and lunatic asylums belonging to the State	4,508,602	11,927,512	—	
Establishments for cripples (medical section) ..	90,751	133,502	—	14
Järvsö Leper Institutions ..	—	26,240	—	

General Hospitals.—During the year 1924, five new hospitals, with an a number of 227 beds, have been completed, and sixteen hospitals rebuilt or e Three infirmaries, with a total of 58 beds, have been erected.

Hospitals for Contagious Diseases.—During the year 1925, 28 new hosp contagious diseases, with 1,167 beds, and three rebuilt or extended hospitals f gious diseases, with a total of 73 beds, received official recognition. Thirty- hospitals for contagious diseases, with 1,486 beds, and eighty-five old hospit 3,195 beds, had already received this recognition, entitling them to a Gov subsidy, before January 1st, 1925.

2. *Sickness Insurance Funds.*

In 1924, there were 1,264 sickness insurance funds, with 768,040 registered m Expenditure amounted to 17,102,088 crowns. Under the heading of the following items are worthy of note:

Subscriptions 14,737,725
State subsidy 2,775,059
Number of days' assistance given in 1924: to men, 3,995,000; to women, 2,

926, a bill was introduced covering the whole of sickness insurance (including y insurance).

er of Doctors, Midwives, etc.

ors.—The number of doctors on December 31st, 1925, was 2,116, of whom 93 their diploma in 1925.

wives.—In 1924, there were 2,997 midwives in the country, *i.e.* 1,764 district ; 454 communal midwives ; 67 midwives in lying-in hospitals, and 692 idwives.

ses.—In the service of the provinces, 254; of the communes, 488 ; and private 113.

e figures do not include nurses in the hospitals and other similar establish-

IV. CONTAGIOUS DISEASES [1].

nic Diseases involving Compulsory Notification.

mallpox	Diphtheria	Scarlet fever	Typhoid fever	Dysentery	Epidemic cerebro-spinal meningitis	Acute anterior polio-myelitis	Encephalitis lethargica	Total
11	26,448	9,750	1,266	71	102	181	—	37,829
2	15,133	9,264	1,123	125	120	141	1,512	27,440
—	6,610	10,718	896	63	79	112	192	18,670
—	4,840	10,828	808	37	85	309	530	17,437
1	4,240	10,882	1,401	82	116	656	318	17,695
—	3,822	10,660	1,467	106	125	505	188	16,873

ollowing cases were treated in the epidemics hospitals during 1924 :

Diphtheria : 3,207, *i.e.* 75.6 per cent of reported cases.
Scarlet fever : 9,195, *i.e.* 84.5 per cent of reported cases.
Typhoid fever : 928, *i.e.* 66.2 per cent of reported cases.

e beginning of the year 1926, experiments were begun in treating chronic is lethargica by inoculations of the parasite of recurrent fever *(Treponema*

ıtion against Smallpox in 1924.

)er of persons vaccinated : 86,633 ;
)er of persons revaccinated : 3,360 ;
ntage of children born in 1923 vaccinated : 76.9.

owing the number of cases of notifiable diseases reported in Sweden in 1919-25 is to be found in ical Intelligence ", No. 10 page 138.

During the year 1924, 55,930 doses of vaccine were supplied (by "d meant a capillary tube containing vaccine for the inoculation of two or three p The vaccine is prepared by the Government Bacteriological Laboratory.

3. *Venereal Diseases.*

Cases reported in 1925 :

	Contracted syphilis	Gonorrhœa	Soft
Men	470	8,819	
Women	206	2,542	
Total	676	11,361	2,
Number of cases in 1919:			
Total for both sexes	5,823	20,471	

Since 1919, when the law instituting the compulsory notification and fre ment of venereal diseases was promulgated, these diseases, especially syphil greatly decreased.

V. BIBLIOGRAPHY.

1. *Medicinalstyrelsens årsberättelse för* 1924 (Hygiene and Health Ser Sweden in 1924 ; Medical Treatment for Mental Cases in Sweden in 1924).

2. *Statistisk årsbok för Sverige* 1925 (Statistical Year-Book of Sweden fo

3. *Dödsorsaker* 1920 (Causes of Death in Sweden in 1920). Published by the Statistical Office.

4. *Social Handbok* (Social Handbook). Published in 1926.

5. *Riksstat för Budgetåret* 1925-26 (Budget 1925-26).

6. *Sveriges Landstings Tidskrift* 1925 (Review of the Provincial Councils of S 1925).

April 1926.

ON OF SOCIALIST SOVIET REPUBLICS

BY

Professor Dr. A. SYSSIN (Moscow)

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I. GENERAL INTRODUCTION.

1925, the Union of the Soviet Republics comprised an area of 21,210,500 ilometers. The population was 139,753,900, of whom 22,979,800 lived in the nd 116,774,100 in the rural districts. According to the first Pan-Russian n 1897, the population was 104,059,277. The population is increasing very though the increase was checked during the war of 1914-17 and the Revolution. 22, however, the population has again begun to increase and already exceeds war figures.

lation.

pulation of the territories at present included in the Soviet Union (1897-1925) :

1897	104,059,277
1914	135,599,015
1920	131,546,045
1923	133,947,438
1925	139,753,900

total for 1925 comprises :

67,247,100 males ;
72,506,800 females.

n other countries, this difference is due to the war, which claimed so many rom the male population. The losses of the Russian Army were : 672,080 d 3,803,827 wounded and gassed, without counting the prisoners or the casual- to disease. The proportion of males to females during the pre-war period ie present date can be seen from the following figures :

Year	Males	Females
1897	51,685,238	52,374,039
1914	67,912,405	67,686,610
1925	67,247,100	72,506,800

excess of females over males is specially noticeable in the country districts. there were in the villages 121 females to every 100 males.

following figures give the population in 1925 of the various Republics of a :

Federal Socialist Republic ..	Capital :	Moscow	96,746,300
.. ..	,,	Kkarkoff	27,663,900
ıssia	,,	Minsk	4,204,500
.. ..	,,	Tiflis	2,492,800
.. ..	,,	Erivan	921,400
n	,,	Baku	2,006,800
stan	,,	Poltoratsk	914,600
.. ..	,,	Samarkand	4,803,600

3. *Movement of Population.*

The vast area of the Union and the absence of a regular registration etc., in some of the more distant districts prevents the compilation of demo statistics. The Central Statistical Office has furnished fairly complete d 1923-24. During those two years the movement of the population of the Un as follows :

(a) GENERAL MORTALITY AND BIRTH RATES.

	Year	Mortality	Births	Natural of pop
		Per 1,000 inhabitants		
Russian Federal Republic ..	1923	23.1	42.6	19
,, ,, ,,	1924	23.7	43.6	19
Ukraine	1923	17.1	35.4	18
,, ...	1924	19.3	41.0	21
White Russia	1924	14.7	37.9	23

In 1911 and 1913—*i.e.* before the war—the death rate was 27.3 per th and the birth rate 43.8 per thousand.

The death rate in the Union (not including the Trans-Caucasian Republ those of Central Asia) is 21.6 per thousand and the birth rate 42.0 per th

The fact that the Russian Federal Republic consists of a number of auto republics, the health conditions in several of which are less satisfactory than central districts of the Union, explains the high death rate. There is a high rate in some of the Governments in the north, for instance, and on the eastern (Vologda, Viatka, Northern Dvina, Siberia, Ural, Karelia, etc.). As against th is a great improvement in the figures in other Governments, as, for instance, (13.7 per thousand) ; Leningrad (15.1 per thousand) ; Crimean Republic (1 thousand).

(b) MARRIAGES AND DIVORCES.

The marriage and divorce figures are interesting. The marriage statis still very high. The following figures will also show that with the facilities for accorded by the Soviet legislation (a declaration on the part of one of the being sufficient for the registration of divorce), there has been a substantial i in divorce :

	Year	Marriages Per 1,000 inhab	Di
Russian Republic	1923	135	
,, ,, ...	1924	111	
Ukraine	1923	112	
,, ...	1924	110	
White Russia	1924	107	

(c) DEMOGRAPHIC DATA FOR CERTAIN LARGE CITIES

rad.

Year	Population	Mortality	Births Per 1,000 inhabitants	Marriages
11-13	2,037,000	21.8	27.7	6.4
18	1,469,000	46.7	17.3	14.4
21	830,000	31.0	34.4	20.9
23	1,085,000	16.1	29.4	14.1
24	1,187,000	16.6	26.6	12.8
25	1,329,000	15.1	28.9	13.7

e great increase in infant diseases which occurred this year and the consequent
in the incidence of mortality under five years of age is responsible for the
leath rate in 1925.
1925, there was a further slight decrease of 9 per cent in the death rate in
ad.

	Population	Mortality	Births Per 1,000 inhabitants	Marriages
3	1,620,000	14.0	30.1	15.6
4	1,772,000	15.2	29.3	14.2
5	1,855,000	13.3	31.0	13.3

absolute figures for the movement of the population of the Union in 1924
ng Trans-Caucasia, Northern Caucasia and former Central Asia) are as follows :

	Total	Males	Females
hs	4,646,591	2,396,519	2,250,342
ths	2,360,235	1,234,507	1,125,728
riages	1,203,980		
orces	120,859		

impossible to give a schedule of the causes of death, as their notification
compulsory either under the former Russian Government nor in the present
Socialist Soviet Republics. It was only in 1925 that the Federal Russian
introduced compulsory notification, and then only for the urban population.
ion is optional in certain towns and governments.
loscow, 22,677 deaths were registered in 1923 ; 2,375 (10.5 per cent) were due
nary tuberculosis ; 1,267 (5.6 per cent) to cancer ; 2,558 (11.3 per cent) to
al debility, and 8.3 per cent to diseases of the heart. Of the infectious diseases,
ver (696 cases) and measles (430 cases) ranked first and second, followed by
fever, with 161 cases.

MORTALITY FROM CERTAIN DISEASES ; LENINGRAD 1923-1925.

Total number of Deaths	Pulmonary tuberculosis	Cancer	Diseases of the heart	Congenital debility	Measles	Scarlet fever	Typhoid fever
1,7482	2,641	1,128	1,755	1,436	240	231	103
1,9695	2,545	1,251	1,392	1,391	765	548	173
2,0999	2,437	1,583	1,310	1,515	665	835	256

4. *Infant Mortality.*

Infantile mortality in the Union is on the decrease. The absolute fig 1924 (excluding Caucasia and Central Asia) give the number of deaths of under one year as 780,035 out of the total number of deaths of 2,360,235. The of births for the same year was 4,646,591. Infantile mortality is thus 32 per the total ; the number of deaths per thousand births was 168 ; whilst before the rate was 260 per thousand.

In certain towns and districts these figures are even more remarkable. lowing figures show the infantile death rate per thousand in Leningrad betwe and the end of 1924 :

1916	270	1921..	173
1917	236	1922..	228
1918	268	1923..	138
1919	284	1924..	168
1920	204		

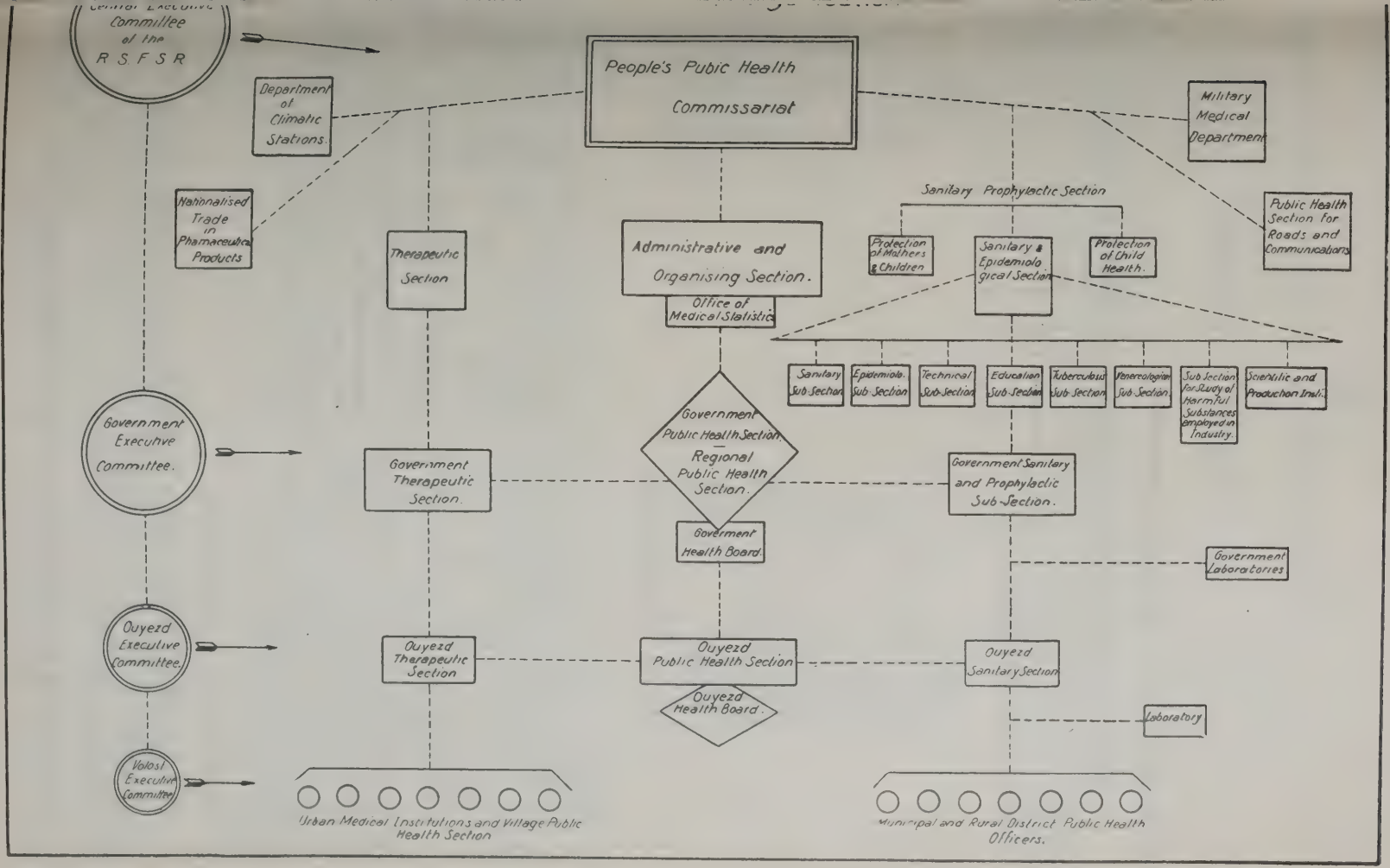
In 1924, in Moscow, the infantile death rate was 177 per thousand and thousand in 1925.

These figures show that the Union of Soviet Republics is one of those c which are subject to a very high birth rate and a rapid increase of population show further that the general mortality of the population is gradually dec The same observation applies to the infantile death rate, which shows a decrease. The various health organisations are endeavouring to maintain this in the death rate.

II. HEALTH ORGANISATION.

There has been no change since 1924 in the general organisation of th services. The Government (the Council of the People's Commissars) in eac eight federal republics of the Union includes an independent organisation ca " Public Health Commissariat ", which is divided into three departments : s therapeutic and administrative. The People's Commissariat of the Russian Republic includes, moreover, a certain number of central departments for the of ensuring the uniform treatment of certain branches of public health thr the entire territory of the Union. These are : (1) the Military and Nava Department ; (2) the Roads, Communications and Frontier Protection Depa and (3) the Health Resorts Department.

The local departments are organised according to a very simple plan. Th system of the Public Health Department in the Republic of the Union is bas the sections of the Central and Local Workmen's and Peasants' Counci Workmen's and Peasants' Council in each government or district has a loca department which is in turn subdivided into sections : sanitary, therapeutic ar nistrative. These local departments are in contact with the local coun are under the control of the central public health organisations and publi commissariats. The plan shown on the following page gives a very compr idea of the health organisation of the Union of Soviet Republics.


Committee of the R.S.F.S.R
People's Public Health Commissariat
Department of Climatic Stations
Military Medical Department
Nationalised Trade in Pharmaceutical Products
Therapeutic Section
Administrative and Organising Section.
Office of Medical Statistic
Sanitary Prophylactic Section
Protection of Mothers & Children
Sanitary & Epidemiological Section
Protection of Child Health.
Public Health Section for Roads and Communications
Sanitary Sub-Section
Epidemiolo. Sub-Section
Technical Sub-Section
Education Sub-Section
Tuberculosis Sub-Section
Venereological Sub-Section
Sub-Section for Study of Harmful Substances employed in Industry.
Scientific and Production Inst.
Government Executive Committee.
Government Therapeutic Section.
Government Public Health Section — Regional Public Health Section.
Government Sanitary and Prophylactic Sub-Section.
Goverment Health Board.
Government Laboratories
Ouyezd Executive Committee
Ouyezd Therapeutic Section
Ouyezd Public Health Section
Ouyezd Sanitary Section
Ouyezd Health Board.
Laboratory
Volost Executive Committee
Urban Medical Institutions and Village Public Health Section
Municipal and Rural District Public Health Officers.

III. INFECTIOUS DISEASES[1].

1. *General Incidence of Infectious Diseases.*

Epidemic diseases continued to decrease in 1925. This decrease is esp
marked in comparison with the years 1917 to 1922, and in particular as rega
different forms of typhus and smallpox. There is, on the other hand, an incr
infantile infectious diseases. The following figures show the general incide
infectious diseases for 1925 :

Disease	Cases
Typhus	70,562
Relapsing fever	18,696
Typhoid fever	159,487
Dysentery	288,174
Smallpox	16,465
Cholera	10
Plague	256
Diphtheria	68,747
Scarlet fever	260,484
Measles	638,586
Malaria	5,141,987
Influenza	2,606,706
Encephalitis lethargica	2,125

2. *Typhus.*

There has been a marked decrease since 1924 in the different forms of t
especially typhus exanthematicus and relapsing fever. In 1924, 126,946 ca
typhus exanthematicus occurred and 70,562 in 1925. There were 49,586 ca
relapsing fever in 1924, and 18,096 in 1925. This decrease has been main
throughout the whole year. During the first half-year of 1925 there were
cases of typhus exanthematicus whilst there were only 15,192 cases during the s
half. The different forms of typhus still occur in the north and east of the
and decrease in the centre and the south. In Ukraine throughout the whole o
there were only 9,270 cases of typhus exanthematicus and 1,435 cases of rel
fever. In North Caucasus there were 871 cases of typhus exanthematicus
in Siberia there were 7,130 cases. The morbidity of typhus in 1925 was 5 per 1
as against 9.5 per 10,000 in 1924, and that of relapsing fever was 1.4 per 1
as against 3.7 in 1924.

3. *Typhoid Fever and Dysentery.*

The figures for typhoid fever and dysentery were fairly high in 1925, alt
the incidence of dysentery has decreased somewhat (338,567 in 1924).

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[1] Two tables showing the number of cases of certain communicable diseases reported in the U.S.S.R. are to be found in " Epidemiological Intelligence ", No. 10, pages 141 and 142.

yphoid fever (159,487 cases) was distributed as follows :

Ukraine	33,996
White Russia	5,341
Moscow	2,467
Leningrad	2,655

ıe health conditions in Moscow are therefore better than those in Leningrad, ı the population is far greater.
ıere was a considerable increase in dysentery in the Urals and Siberia.

ıllpox.

nallpox has noticeably decreased. The following figures show the morbidity ıect of this disease in Russia from 1908 to 1925 :

Year	Cases of smallpox	Rate per 10,000
1908	127,726	8
1910	165,265	10
1912	81,588	5
1914	94,162	6
1916	84,030	9
1919	186,755	30
1920	124,357	18
1921	114,046	12
1922	70,876	7
1923	47,617	4
1924	28,523	2
1925	16,465	1.18

ıis decrease is the more marked as the majority of smallpox cases occur in districts in the north and east which are furthest removed from the centre of ion. There were 3,762 cases in the Urals and the Republic of Bachkiri ; 1,094 Tartar Republic ; 1,531 in the Viatka district ; 3,287 in Siberia and 1,251 in r East. In 1925, there were in the Ukraine 505 cases of smallpox, 6 in Moscow ? in Leningrad.

hlheria, Scarlet Fever and Measles.

fantile infectious diseases increased considerably in 1925. In 1924, there were 5 cases of scarlet fever, an increase of 30 per cent. Measles doubled (66,620 n 1924). The number of cases of diphtheria remained constant. The most ıble increase in infectious diseases occurred in the Ukraine, where there were cases of scarlet fever and 18,647 cases of diphtheria. In the central govern- of the Union there were 57,911 cases of scarlet fever and 10,456 cases of diph- A serious epidemic of scarlet fever broke out in Moscow, where 11,926 cases ed in 1925.

'aria.

alaria showed some decrease in 1925, but the Union still suffers considerably his pandemic, which dates from 1921. The following are the malaria figures 22 to 1925 :

Year	Cases	Rate per 10,0
1922	2,651,140	268
1923	6,232,921	474
1924	5,977,662	446
1925	5,141,987	368

In 1925, 693,157 cases of malaria were notified in the Ukraine ; 348,9 in the Trans-Caucasian Federation ; 342,867 in Siberia ; 869,991 in the N Caucasus and 684,570 in the South and in the Volga district.

7. *Influenza and Epidemic Encephalitis.*

Influenza increased in 1925 : the rate was 185 per 10,000, as against 149 i Encephalitis lethargica remained constant : 2,198 cases in 1924, 2,125 cases i

8. *Cholera.*

In 1924, the whole Union was free from cholera with the exception of th district of Rostoff-on-the-Don (13 cases were notified, of which 11 were in and the neighbouring district) ; in 1925, there were only 10 cases of cholera epidemic did not spread and only a few sporadic cases were observed. No fre of cholera has been notified in the whole of the Union since August 1925.

9. *Plague.*

In 1925, two districts in the Union still contained plague centres: the Lake on the Manchurian frontier, and the South-Eastern Steppes near the Caspia In the former there were 3 cases of plague in 1925—all primary cases (3 cases i 6 cases in 1924).

There was a small outbreak of plague in the South-Eastern Steppes which over a very wide area. During the summer months of 1925 this outbreak, whi connected with the epizoötic disease among the marmots (tarabogans) spr the Kalmuck Steppes between the Volga and the Don. The winter outbr 1925, linked with the epizoötic disease of field rats, spread towards the east fr Volga to the Bukeiev Government. The total number of plague cases noti that district in 1925 was 253, of which 185 were fatal. No cases were imported t the sea-ports, and the plague did not spread beyond the districts mentioned.

10. *Leprosy.*

In 1925, 479 cases of leprosy were notified, chiefly in certain districts of the where isolated cases had already previously been observed: near the Baltic the Esthonian frontier (42 cases), the Volga district, the government of Astr and the Caspian Sea coast (129 cases), in the Northern Caucasus, the Black Sea (111 cases), Azerbaijan, Caspian Sea (36 cases), Turkestan (77 cases). These include the cases notified during the preceding years.

'her Infectious Diseases.

mong other infectious diseases to which attention should be drawn are the fol-
; :

Anthrax (Pustula maligna)	16,029
Trachoma	793,603
Scurvy	62,652
Rabies	40,898

rachoma occurs principally in the small States of the Volga and in Siberia.
l cases were notified in the Tartar Republic ; 46,096 in the Republic of the
vaches ; 72,413 in the Votiak District ; 46,440 in the Bashkir Republic ; 65,910
eria and 71,334 in Ukraine.

IV. CAMPAIGN AGAINST INFECTIOUS DISEASES.

:teriological Institutes and Laboratories.

he health organisations engaged in the campaign against infectious disease had
table network of bacteriological institutes and laboratories at their disposal in
The Russian Federal Republic had 244, of which 31 large institutes were for the
lisation of health analyses (chemical, forensic, etc.). These institutes made
iological preparations, vaccines and serums, a large proportion of which was
at the disposal of the Public Health Commissariat and distributed according
instructions. The number of Pasteur clinics in the Russian Federal Republic
e treatment of rabies amounted in 1925 to thirty-four.
he other Republics of the Union possess ten further institutes. The manufac-
f anti-cholera vaccines decreased, as these preparations were used solely for
my, in which vaccination is compulsory. Some of the institutes manufacture
iccines. The production of anti-diphtheria serum was sufficient for the needs
country ; in 1924, in the Russian Federal Republic alone (not including Ukraine
ie other Republics), 2,200 litres of anti-diphtheria serum, or 110,000 doses
nade. The preparation of these serums was superintended by the State Insti-
f Control in Moscow. In accordance with the resolutions adopted by the last
:ss of Bacteriologists and Epidemiologists, research departments were established
bacteriological institutes and these departments took an active part in the cam-
against epidemics. Further, in several institutes, sections for the investigation
aria and protozoa diseases were created. The institutes carried out researches
epidemic centres in connection with the campaign against vocational diseases.
some of them special sections investigated the causes of vocational diseases
ch workers are subject (Towns of Sverdlosk, Rostoff, etc.).

npaign against Smallpox.

s part of the campaign against smallpox, vaccination was made compulsory
cree of the Council of People's Commissars on October 18th, 1924. The Insti-
of the Russian Federal Republic manufactured 25,000,000 doses of vaccine in
The number of patients vaccinated is extremely high. In 1925 in the Ukraine,
585 were vaccinated and 1,587,001 were re-vaccinated. The majority of people
ated were in the rural districts, where an average of 926 primary vaccinations
000 births was carried out.

3. *Campaign against Scarlet Fever and Diphtheria.*

An attempt was made in certain towns to introduce prophylactic vaccina a means of fighting scarlet fever and diphtheria. In 1925 in the Ukraine, 1 infants were inoculated according to Shick's system. Of this number, 25,00 inoculated according to the method of active immunisation. The problem of tile and infectious diseases presents great difficulties for the health organis

4. *Campaign against Malaria.*

The Russian Federal Republic has 124 anti-malaria stations, and the Ukra The Third Pan-Russian Congress, whose debates were recently published, r Moscow in 1925. The Union purchased 75,000 kg. of quinine and the organisations have published large quantities of popular literature on the sub malaria.

5. *Anti-Plague Work.*

The principal centres of anti-plague work is in the south-eastern district of pean Russia. The headquarters are in the Microbiological Institute in Sa which has nine laboratories, ten dispensaries and twelve survey brigades. brigades carry out investigations concerning the rodents in the Steppes and, wi People's Commissariat for Agriculture and its various departments, takes wh measures may be necessary for their destruction. An Anti-Plague Pan-R Conference met in 1925 at the Saratof Institute ; the results of its work have published and form an important volume. This Institute publishes a period the *Microbiological and Epidemiological Courier*—and organises special courses year for medical practitioners who wish to do anti-plague work.

There are also anti-plague centres in Rostof-on-the-Don, Odessa, Irkutsk, kent, Tchita and in the bacteriological institutes.

The fact that the Union lacks a sufficient supply of disinfecting appliances m the campaign against epidemics extremely difficult. These appliances are c to be found in the hospitals. The Public Health Commissariat recently d regulations obliging the local health organisations in the rural districts to build s huts for patients suffering from infectious diseases. Unfortunately it is at p very difficult to put these regulations into force.

V. CAMPAIGN AGAINST SOCIAL DISEASES.

The campaign against social diseases is being continued on the same lin formerly. Every endeavour is made to apply prophylactic measures and to the sympathies of the great mass of the population in this campaign.

In 1925, 860,243 cases of pulmonary tuberculosis were notified in the U (excluding the Ukraine). There were 239,507 cases of tuberculosis of the bon

1. *Tuberculosis.*

At the end of 1925, there were 363 anti-tuberculosis dispensaries in the Unio which 206 were in the Russian Federal Republic, 137 in the Ukraine and 20 i other republics.

present the dispensaries are chiefly for the use of the urban populations. It
y last year that the organisation of dispensaries in the rural districts was begun.
f these dispensaries are independent and some are attached to the therapeutic
es.

the towns in the Union, with the exception of five, with a population exceeding
inhabitants, are supplied with dispensaries, and out of 104 towns with a popu-
of from 20,000 to 50,000, seventy-two have dispensaries.

e dispensaries in the Union differ from those in the rest of Europe in that they
a series of auxiliary organisations for the treatment of tuberculous patients.
organisations are as follows :

(a) Diagnosis sections ; 86 of these are provided with beds ;

(b) Day sanatoria for adults, where patients may rest for a few hours after their work (6) ;

(c) Night sanatoria for adults (112) ;

(d) Day sanatoria for children (62) ;

(e) Other institutes (36).

all, the dispensaries have at their disposal 302 auxiliary institutes with a total
beds. Further, some of the dispensaries have established diatetic restaurants
he patients receive a special diet suitable to their condition as prescribed by
lical officers of the dispensary. There are 118 of these restaurants capable
mmodating 2,695 persons.

is organisation of the dispensaries has given excellent practical results ; patients
not only advice but also all medical and social help which their condition may

e sanatoria work in close touch with the dispensaries, whence they receive
ients. At the end of 1925, the Union possessed 187 sanatoria with 13,689

ese sanatoria may be classified as follows :

Sanatoria for adults suffering from pulmonary tuberculosis 123 ; number of beds 9,340 ;

Sanatoria for children suffering from pulmonary tuberculosis 30 ; number of beds 1,886 ;

Sanatoria for patients suffering from tuberculosis of the bones 21 ; number of beds 1,802 ;

General sanatoria for tuberculosis 13 ; number of beds 605.

ally, there were 43 hospitals for tuberculosis patients with 2,496 beds, and
titutes for patients suffering from cutaneous tuberculosis, with 150 beds.
mber of anti-tuberculosis institutes in the Union was seven.

e anti-tuberculosis dispensaries work with the Social Aid Councils which are
l to every dispensary ; these councils include representatives from the work-
rganisations and trade unions. It is through these councils that the dispen-
istribute their help, such as payment of rent, food, etc. These councils also
valuable services in supervising health conditions in factories and workshops.
ere were 662 visiting nurses employed by the dispensaries, and there were 599
of charity.

e anti-tuberculosis section of the Public Health Commissariat of the Russian
Republic publishes a special anti-tuberculosis annual giving all the Govern-
structions, decrees and regulations concerning tuberculosis. An album of the
types of dispensaries and sanatoria will be published in 1926. In view of the

fact that the great anti-tuberculosis campaign has only just begun, it is difficult to estimate the results ; certain results can, however, already be seen in those which publish exact statistics. The following are the morbidity figures of pulm tuberculosis in Leningrad from 1910 to 1924.

	Per 10,000
1910	291.02
1914	284.05
1918	355.61
1920	506.74
1921	337.46
1922	352.16
1923	243.41
1924	214.48

A similar decrease has been observed in Moscow, but as regards the rest country a lengthy campaign with the aid of the health organisations and of the lation itself will be necessary before equally good results can be obtained.

2. *Campaign against Venereal Diseases.*

The campaign against venereal diseases was continued in 1925 on the same as in 1924. There were 382 anti-venereal institutes in the Union (excludin Caucasus and Central Asia) of which 231 were in the Russian Federal Republi 151 in the Ukraine. In the Russian Federal Republic there were 101 urban di saries, 64 venereological centres and 66 venereological brigades for the rural dist Two and a-half million patients, including 270,000 new patients, consulted the reological institutes in the Russian Federal Republic in 1925. A large numb patients was, moreover, treated in the hospitals. In Ukraine the number of co tations was 2,213,727.

The Public Health Commissariat has drawn up a comprehensive anti-ven programme which provides for the establishment of important organisations i rural districts where extra-genital syphilis is highly developed, above all am the ethnical minorities.

The Second Venereological Congress met in Kharkoff in 1925 and the re of its discussions were published in " Venereology and Dermatology ".

A control commission for salvarsan preparations was constituted in 19 Moscow and attached to the Public Health Commissariat. This commission co all preparations, whether of Russian or foreign origin. Moreover, Social Aid Cou are attached to the anti-venereal dispensaries.

3. *Cancer.*

The statistics for cancer are incomplete, and it is therefore difficult to giv idea of the incidence of this disease in the Union. The data which we have qu on the subject of the death rate in Leningrad prove, nevertheless, that canc extremely rife throughout the country. The First Anti-Cancer Conference me Moscow in 1925 on the initiative of the Public Health Commissariat and of the Ru Federal Republic, and the results were published in a book.

VI. CAMPAIGN AGAINST OCCUPATIONAL DISEASES.

measures taken by the health organisations in 1925 for the prevention of
ınal diseases were the following :

edical examination of workmen between the ages of 16 and 18 employed
es or workshops ; in future, these medical examinations are to take place

ıstitution of a medical examination of workers in foodstuff industries (fac-
ops, etc.).

stitution of periodical medical examinations of workers in particularly
occupations. These examinations are carried out every two or six
The industries which are considered unhealthy are those in which lead,
ıs, mercury, aniline, arsenic, etc., are employed. Airmen and operators
; stations are placed on the same footing as workmen employed in unhealthy
ns.

ıbove-mentioned enquiry (young workmen) has now been conducted for
s and has furnished very interesting data regarding the health of this section
ıulation. The general health of young workmen leaves much to be desired,
physical development is gradually improving. The information furnished
vernments shows that 11 per cent of these young workmen are suffering
rculosis and that a very large percentage are anæmic or debilitated. Many
ptoms of overwork (head-ache, insomnia, nervous excitability). On the
e data obtained, medical officers can now take steps to improve the working
conditions of the young working population.
bject of the medical examination of workers in food industries is to protect
ner against the risk of infection. They are ordinary measures of sanitary
ı.

ıore difficult to give an opinion on the third group of medical examinations
ı unhealthy occupations). The Commissariat of Public Health, in conjunc-
he Labour Commissariat, has worked out the *technique* and procedure to
l in these examinations, and both have been applied since the beginning
The list of unhealthy occupations will gradually be completed. The scien-
tes for occupational diseases have been instructed by the Commissariat
Health to work out appropriate methods for detailed medical examination
ıhealthy occupation. In 1926, two new institutes of this description were
: at Sverdlosk and another at Saratof.
:al sanitary authorities have, as usual, carried out enquiries into the health
of certain specific trades and have studied the health conditions of labour
ıte of health of the work-people. These enquiries have been conducted
rge scale, particularly in Moscow. By the end of 1925, they had been carried
establishments employing 191,158 workmen, 20 per cent of whom were
:he metal and textile industries and 12 per cent in the printing industry, etc.
health sheets were introduced in respect of 144,750 workers, and 102,386
under permanent medical observation. A number of workers who were
ave been placed in therapeutic establishments or received medical assis-
ief of various kinds. In 1925, 48,700 persons benefited as a result of these
iries : 19,606 were sent to anti-tuberculous dispensaries ; 11,840 were sent
f rest ; 4,766 received food from the dietetic kitchens, 1,424 were cared
sanatoria, 1,680 in ordinary sanatoria ; 767 were sent to health resorts,

962 were transferred to trades more suitable to their state of health; 3,287 were additional holidays and 4,377 were treated for dental trouble. 56 per cent persons medically examined received assistance in one form or another.

It is true that the organisation of medical relief and the reorganisation therapeutic institutions is possible only at Moscow—the capital of the Union—possesses considerable medical and financial resources and a very advanced ind proletariat. The amount of the budget appropriation of the City and Gover of Moscow for public health purposes was 30 million gold roubles in 1925, a Workers' and Peasants' Council at Moscow readily consents to any improv in this direction.

At Moscow, medical relief is afforded mainly through the dispensaries. the medical institutes are responsible not only for prophylaxy and the ca against occupational diseases but for the prophylaxy of all diseases among the lation. The experiment made at Moscow has given very satisfactory results as the diminution of the number of patients seeking relief in institutions, and regards the rational utilisation of all medical resources. Whenever mass en have been conducted, all doctors in the hospitals and clinics have co-operate acquainting themselves with the conditions of labour both from the sanitary occupational point of view. Social and medical relief is distributed by committees composed of workmen and doctors. This system of medical re in 1925 been discussed on many occasions, by the medical Press and at con and in particular in December 1925, by the Pan-Unionist Congress of Rural Officers, who have endeavoured to apply it in the country districts. These m involve considerable expenditure and the specialised training of the doctors then In order to give medical officers this specialised training for the campaign occupational diseases, the Commissariat of Public Health instituted during the months of 1925-26 special courses in the clinic for social and occupational of the Chief University of Moscow. Moreover, all these questions have been di by the Ninth Pan-Russian Congress of Medical Officers of Health which was Moscow in May 1925.

VII. PROTECTION OF CHILDREN AND YOUNG PEOPLE.

The central institution for this purpose is the prophylactic polyclinic f dren ; its methods of work are the same as those of the dispensaries for social This polyclinic is a central institution to which various institutions for chi both therapeutic and pedagogic—are attached, such as schools, sanatoria, for open-air cures for children, sanatoria for abnormal children and hospitals f suffering from trachoma, honeycomb ringworm, etc. Specialists in these carry out at these institutions mass examinations of school children and who have not yet reached school age. At present these institutes exist the larger towns and capitals of the Governments. On January 1st, 192 were 101 in the whole of the Union (not including the Caucasus and Tur The number of these institutions is quite inadequate. In the towns they approximately 30 per cent of the children. In the villages they are virtua existent. The Russian Federal Republic possesses 44 open-air schools sanatoria for abnormal children. The general supervision of these institu children, children's homes and colonies is entrusted to the doctors of whom t far too few in the country districts, specially responsible for the protection of th

ren. In the whole of the Union (with the exception of the Caucasus and Tur- there are only 1,381 ; these doctors are responsible for the medical supervision rge organisations for children and young people, such as the "Young Pioneers", nion of Communist Youth ", etc., the membership of which runs into hun- thousands. They are also responsible for the teaching of physical culture organisations. The Supreme Council for Physical Education—the represen- which is the Commissary for Public Health of the Russian Federal Repub- Semachko—has published a quantity of popular and scientific literature nded a periodical journal on these subjects.

VIII. MATERNITY AND INFANT WELFARE.

number of institutions for the protection of mothers and infants in the Union ably increased in 1925. Formerly a certain number of such institutions were nce, mainly in the towns, but now their number is increasing in the lso. At the end of 1925, there were in the Union 5,126 such institutions, *i.e.*:

Consulting rooms for infants	932
Consulting rooms for pregnant women	218
Crèches attached to the factories	584
Village *crèches* (temporary and permanent)	2,876
Homes for mothers and infants (up to the age of two) ..	112
Homes for children over two years of age	404

f the consulting rooms for infants—*i.e.*, more than one-third—are established istricts. A department for legal consultations is attached to these consulting the purpose of advising women on the protection of their rights. Most institutions give their services free of charge.

number is, of course, still inadequate for the vast territory of the Union, uld be remembered that before the Revolution of 1917-18 nothing had been is direction apart from a few isolated institutions at Moscow and at Lenin- e institutions now in operation have been established during the last few he decrease in infant mortality throughout the Union, to which we have ention, may be attributed—particularly in the towns—to these protective

lent work has been done by the " women's unions " which now exist through- ountry, their aim being the education—both political and general—of These unions take an active part in propaganda for the protection of mothers s and also sit on all committees set up for this purpose.

f their most useful forms of activity is the organisation of " child-welfare uring which intensive propaganda is carried on, funds are collected, enquiries foot, etc. ; a vast quantity of popular literature relating to all these questions ublished. Special mention should be made of the propaganda work under- ng the eastern populations in Turkestan, among the Uzbegs, and in the re women are beginning to emancipate themselves from the state of slavery hey used to be held, and where social conditions and religion impede pro-

rganisation of obstetrical assistance is being improved and developed. ns the majority of confinements take place in the public health institutions ndance is provided free of cost ; in forty-one towns in the Ukraine, 95.4

per cent of all confinements took place in obstetrical clinics. In the villag matters are not yet so well organised.

The law permitting abortion produced in therapeutical establishments authorisation of special committees is still in force. The People's Comm of Public Health is convinced of the wisdom of its policy in this very importa question. The statistical figures for abortions produced in recent years in cons of this law show that there has been an increase in such operations. The are, however, not higher than those for other countries. According to data by the Commissariat of Public Health, illegal abortion is often followed by ver complications and is undertaken by unskilled persons, whereas legal abortion tised in the hospitals is considerably less dangerous. In the towns of the Soviet Republic 134,000 abortions were registered in public hospitals betwe 1924 and July 1925. Enquiries made by the Commissariat for Public Healt rural hospitals of the Republic show that the number of abortions produced by in the villages is 120,000 annually. Abortion is certainly more frequent in t than in the villages. It will be of interest, therefore, to quote the figures for L and Moscow.

At Leningrad in 1924, abortion was produced in 6,692 cases out of a 31,906 confinements. The number of births was 26.6 and the number of a 5.6 per thousand inhabitants—that is to say, there were 21.2 abortions per 10

The same set of statistics shows that at Moscow there were 27 abortions births.

It would be incorrect, however, to conclude that the increase in abortio to the new legislation. The fundamental causes must be sought in present-d conditions.

Abortion cannot be produced in a hospital without the authorisation of committee, and this fact has made it possible to collect a large amount of inf concerning the reasons which induce women to have recourse to abortio committee is composed of representatives of the women's unions and of on Material difficulties appear to be one of the most frequent causes. The a that it is mostly very young women that have recourse to abortion is not t the contrary, whereas only 12 per cent are cases of first pregnancy, ab much more frequent among women pregnant for the second time. In th it is mainly women between twenty and thirty who seek abortion ; in the women between thirty and forty. At Leningrad, in 1924-25, the greater nu cases were those of women between twenty-five and thirty. The average a women seeking abortion at Leningrad in 1924 was twenty-nine. The rea which the committees either authorised or forbade abortion may be of some

1. REASONS FOR AUTHORISING ABORTION GRANTED AT LENINGRAD IN 1924.

	Per cent
Material difficulties	72.4
Poor health	17.0
Very young children in the family	4.4
Large family	2.2
Other causes	4.0
Total	100.0

2. REASONS FOR REFUSING ABORTION.

	Per cent
Easy circumstances	72.0
Good health	6.1
Advanced stage of pregnancy	8.5
Repeated abortions (in the course of the same year) ..	6.9
Other causes	6.5
Total	100.0

IX. SANITARY SUPERVISION.

tary supervision in the Union is governed by the special laws of 1922 and ch determine the number of medical officers of health and the extent of ers. In view of the increased needs of the population, the Russian Federal has been obliged to revise these laws in order to increase the number of fficers of health and extend their powers. On January 1st, 1926, there were ion 2,003 medical officers of health ; of these, 160 were members of the admi- health staff of the sanitary sections, 320 were detailed for work on the ommunication (railways and navigable rivers), 15 were working in health nd 1,508 in the country districts. They were distributed as follows among us republics of the Union :

Russian Federal Republic	1,124
Ukraine	246
White Russia	32
Trans-Caucasian Republic	85
Turkestan and Uzbegistan	21

ecember 1925, a conference of the Epidemiological Sanitary Sections of the us Republics and of the Union was held at Moscow, at which questions of rganisation were discussed. This conference laid down the following prin-

Towns should possess one medical officer of health and one inspector of er 25,000 inhabitants, and one medical officer for the supervision of food- 50,000 inhabitants.

Villages should possess one medical officer of health per 100,000 inhabitants ress of Medical Officers of Health which met at Moscow in March 1926 increase this number to one per 25,000 inhabitants in the industrial rural

sion of Foodstuffs.

ommissariat of Public Health is helping to draw up and edit regulations ffs. Various commissariats, institutes and specialists are taking part in tant work. The first chapter, dealing with bread, milk and meat is com- the rest will be ready for publication towards the middle of 1927.

sion of the Water Supply.

ommissariat of Public Health is endeavouring to improve the water supply ntry districts. Several of the Governments have instituted enquiries

regarding the sanitary supervision of water supplies (Ukraine, Tula, Tambo
others are following their example. Enquiries are now being conducted, w
assistance of technical experts, to determine the best methods of supplying
with water.

3. *Sanitary Supervision of Dwellings.*

Special committees have been set up in all the Governments for the s
supervision of dwelling-houses. The Central Committee of the Union for pro
the construction of workmen's dwellings has its headquarters at Moscow.
health organisations have instituted enquiries into the housing of peasants (U
Karelia). Housing conditions in the Union are still extremely unsatisfactory
buildings, however, show a certain improvement.

4. *Sanitary Legislation.*

In 1925, the epidemiological section of the Commissariat of Public He
the Russian Federal Republic collected and published in one volume all the s
laws and ordinances issued by the Soviet authorities between 1918 and 192
book is already in circulation.

5. *Sanitary Supervision of Communications.*

All railway lines and navigable waterways possess local public health s
The sanitary service is directed by transport medical officers—200 for the
and 120 for navigable waterways. The average length of railway system
to each sanitary district with a medical officer is 350 km. ; in the case of wa
there is on an average one sanitary district for every 550 km. Important
junctions possess isolation stations (17 in all). The railways of the Union
161 wagons used for the disinfection of wagons and material, 75 travelling l
ries, 15 exhibition wagons, etc.

In 1925, a central laboratory, with a clinic, was established in Moscow for t
of occupational diseases and their causes among railwaymen. Seaboard
stations have been established in 50 ports on the Black Sea, the White Sea, th
and the Pacific and Arctic Oceans (stations or detachments for sanitary supe

X. THERAPEUTIC ESTABLISHMENTS.

On January 1st, 1925, the Union of Socialist Soviet Republics possessed
lowing therapeutical institutions, maintained by the State or by local funds and
by the public health organisations.

TOTAL NUMBER OF HOSPITALS AND BEDS IN THE UNION (TOWNS AND VIL

	Number of hospitals	Number of be
Russian Federal Soviet Republic ..	3,239	133,275
Ukraine	859	26,982
White Russia	103	3,293
Trans-Caucasian Republics	137	9,123
	4,338	172,673

nis figure must be added 3,117 beds in the hospitals of Uzbegistan and Turk-, bringing the total number of hospital beds available in the Union (not those in the military hospitals and prisons) to 175,790.
nese hospitals, 2,279 with 54,771 beds—*i.e.* 33 per cent of the total—are in the villages.

TOTAL NUMBER OF POLYCLINICS (IN THE TOWNS)
)T INCLUDING TRANSCAUCASIA OR THE CENTRAL ASIAN REPUBLICS).

Russian Federal Soviet Republic	1,317
Ukraine	779
White Russia	28
Total..	2,124

villages are provided with medical centres, some of which have no hospitals ss polyclinics with pharmacies.

TOTAL NUMBER OF MEDICAL CENTRES IN THE RURAL AREAS.

Russian Federal Soviet Republic	3,502
Ukraine	1,376
White Russia	177
Total	5,055

rans-Caucasian Federation (Georgia, Azerbaijan and Armenia) possesses 567 enters in the towns and villages. There are 161 similar institutions in and Turkmenistan. The total number of institutions for out-patients in the towns and villages of the Union was, in 1925, 7,907.
bove figures do not include anti-tuberculous or anti-venereal dispensaries lfare centres.

towns the medical service is quite adequate. In the villages, however, r of medical institutions is still insufficient. Several Pan-Union Confe-nedical officers and public health departments have, in their resolutions, l the necessity of increasing the number of village medical centres. On 14th, 1925, the Council of the People's Commissars of the Russian Federal ublished a decree on "guiding principles for the establishment of a normal ganisation throughout the country".
lication of this decree, all the Governments of the Republic are at present drawing up a scheme for a regular system of medical districts, founded on le of free medical treatment, close contact between this organisation and and an adequate number of hospitals. Under this scheme, every rural ive area (15,000 to 40,000 inhabitants) will have a hospital with an obste-rtment, annexes for the treatment of infectious diseases and dis-or the campaign against tuberculosis and infectious diseases. These ntres will also undertake a certain amount of health work. Secondary ing a smaller radius of action (6,000 to 9,000 inhabitants), with hospitals nics, will gradually be established in connection with these main rural

The programme is a vast one ; it will entail considerable expenditure spre
a number of years. The first stage in its realisation has already been con
viz., the creation of the village sanitary organisation with 5,055 rural medical
As a result of the close relations maintained with the local Councils of P
Representatives, it will be possible to develop these medical centres later o
health work of these organisations (vaccination, disinfection, health education
sanitary inspection of school children) is to be placed under the general d
of medical officers of health.

On December 2nd, 1925, the Council of the People's Commissars of the
Federal Republic promulgated a Decree ameliorating the financial and lega
of village doctors. On January 1st, 1925, the Russian Federal Commiss
Public Health had 5,180 State pharmacies under its direction. The number of
pharmacies was 230. It will thus be seen that almost all pharmacies have bee
over by the State.

The wholesale purchase and sale of pharmaceutical products is effected
a State Trust (the Gosmedtorg) which has a number of factories, depots an
houses. The governing body of this trust is appointed by the Commissariat o
Health.

XI. HEALTH RESORTS.

In 1925, there were 26,705 beds in the health resorts administered by the (
sariat of Public Health. During the year, special health resorts were establi
peasants in the Crimea and the Caucasus. In the Crimea the peasants' s
are housed in the former imperial palaces at Livadia, which were built by Nic
a few years before the war. During 1925, 3,653 peasants were received as p
In the same year, the total number of patients treated in the sanatoria was
the number of out-patients being 58,840. Of these, 48.3 per cent were worki
per cent peasants, 33.7 per cent employees, etc. The various health resorts (
in all 26.705 patients.

XII. DOCTORS AND MEDICAL RELIEF.

On January 1st, 1925, there were in the Union, 43,154 doctors—29,77
Russian Federal Republic, 9,805, in the Ukraine, 617 in White Russia, 2,03
Trans-Caucasian Republics, and 339 in former Central Asia. The vast ma
these doctors work in the hospitals and institutions administered by the
departments of the Public Health Organisation. In the Russian Federal R
for instance, out of 29,779 doctors, 22,923—*i.e.* 77 per cent—are State offici

In addition, there are in the Russian Federal Republic 2,508 dentist
pharmacists, 5,746 midwives, 21,673 male and female nurses and 109,612
employed as auxiliary personnel.

The Union possesses 25 Schools of Medicine (faculties of medicine and ins
At the end of 1925, the Russian Federal Republic approved a new progra
medical training. Among various other interesting changes we may men
introduction, as a compulsory subject in all faculties of medicine, of four c
hygiene :

1. Experimental hygiene (third year of studies) ;
2. Labour hygiene ;
3. School hygiene (fourth year) ;
4. Social hygiene (fifth year).

Moscow, April 1926.

NITED STATES OF NORTH AMERICA

BY

Jason WATERMAN, LL.B.

AND

Brock C. HAMPTON, A.B.

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I. GENERAL INTRODUCTION.

)ximately 3,000,000 square miles, exclusive of possessions.

'ion..

ated population July 1st, 1923 : 110,663,502 ; 1924, 112,078,611 ; 1925, 0.

ly.

)llowing table gives the number of deaths and the crude death rate in the :tration area of the United States from 1915 to 1924. This area is increasing It included 67.5 per cent of the population in 1915, and 88.4 per cent in

OPULATION, NUMBER OF DEATHS AND DEATH RATES IN THE DEATH REGISTRATION AREA, 1915 TO 1924.

Year	Population in Thousands	Number of Deaths	Deaths per 1,000 Population
.. ..	67,096	909,155	13.6
.. ..	71,349	1,001,921	14.0
.. ..	74,984	1,068,932	14.3
.. ..	81,334	1,471,367	18.1
.. ..	85,166	1,096,436	12.9
.. ..	87,487	1,142,558	13.1
.. ..	88,668	1,032,009	11.6
.. ..	93,242	1,101,863	11.8
.. ..	96,986	1,193,017	12.3
.. ..	99,030	1,173.990	11.9

0, when the registration area included 40.5 per cent of the population, the was 17.6 per thousand. The decrease in the death rate has been fairly h a notable exception in 1918, the year of the influenza epidemic.
timated population in thousands, number of deaths, and crude death rates ndar year 1924 for 38 States are shown in the following table. The States :d by sections geographically. The figures are provisional, but it is not :at the final figures will differ materially from these, though the estimated : for a few States may be revised.

(b) ESTIMATED POPULATION, DEATHS AND DEATH RATES IN 38 STATES, 1
(PROVISIONAL FIGURES).

State	Estimated Population in Thousand	Number of Deaths	Deaths Pop
Total 38 States	96,338	1,139,671	1
New England States :			
Maine	780	10,754	1
New Hampshire	449	6,357	1
Vermont	352	4,860	1
Massachusetts..	4,078	49,358	1
Rhode Island	633	8,337	1
Connecticut	1,504	16,989	1
Middle Atlantic States :			
New York	10,975	140,205	1
New Jersey	3,443	40,840	1
Pennsylvania	9,209	113,321	1
East North Central States :			
Ohio	6,219	69,950	1
Indiana	3,037	37,162	1
Illinois..	6,878	77,133	1
Michigan	4,066	47,324	1
Wisconsin	2,770	28,250	1
West North Central States :			
Minnesota	2,531	24,579	
Iowa	2,487	23,774	
Missouri.	3,455	40,474	1
Nebraska	1,345	12,388	
Kansas..	1,806	17,898	
South Atlantic States :			
Delaware	233	3,015	1
Maryland	1,521	20,974	1
Virginia	2,424	29,175	1
North Carolina.	2,723	33,238	1
South Carolina	1,762	22,895	1
Georgia	3,029	34,795	1
Florida..	1,069	15,861	1
East South Central States :			
Kentucky	2,475	26,806	1
Tennessee	2,409	28,018	1
Mississippi	1,791	21,148	1
West South Central State :			
Louisiana	1,864	24,480	1
Mountain States :			
Montana	629	4,970	
Idaho	481	3,787	
Wyoming	217	2,063	
Colorado	1,005	12,528	1
Utah	485	5,048	1
Pacific States :			
Washington	1,456	14,580	1
Oregon..	835	9,505	1
California	3,913	56,832	1

(c) AGE AND SEX DISTRIBUTION OF DEATHS FROM THE PRINCIPAL DISEASES IN 38 STATES, 1923.

Causes of death	All Deaths	Under 1 year	1 year	2 years	3 years	4 years	5 to 9 years	10 to 14 years	15 to 19 years	20 to 24 years	25 to 29 years	30 to 34 years	35 to 44 years	45 to 54 years	55 to 64 years	65 to 74 years	75 years and over	Age unknown
Deaths — All causes	1,174,065	163,354	33,180	16,082	9,732	7,338	23,942	17,833	28,321	37,016	39,310	40,890	96,916	119,826	153,175	184,754	200,790	1,606
Males:																		
White	549,623	79,061	14,638	7,293	4,457	3,392	11,526	8,410	11,401	13,793	15,201	17,318	44,148	57,713	78,150	92,630	89,863	629
Coloured	75,636	13,194	3,108	1,305	688	465	1,441	1,359	2,754	4,338	4,219	3,732	9,026	9,701	7,243	6,128	6,266	369
Females:																		
White	478,178	60,279	12,707	6,253	3,915	3,019	9,483	6,580	10,563	14,061	15,453	15,881	35,311	44,229	61,325	80,388	98,676	355
Coloured	70,328	10,820	2,727	1,231	672	462	1,492	1,484	3,603	4,824	4,137	3,959	8,431	8,183	6,457	5,308	5,985	253
Typhoid and Paratyphoid Fever 1:																		
Males	3,686	29	32	30	36	32	224	302	568	585	339	297	504	335	228	110	26	9
Females	2,804	18	34	35	25	39	244	352	503	381	274	193	289	199	125	66	20	4
Measles 2:																		
Males	1,314	135	98	55	44	30	127	67	79	66	50	47	105	140	89	94	79	9
Females	1,357	108	66	48	56	36	114	109	96	105	59	64	106	117	75	100	93	5
Scarlet fever 3:																		
Males	72	6	3	1	0	0	0	2	1	6	3	4	10	12	4	17	3	0
Females	54	8	0	2	0	1	2	1	2	5	3	5	6	7	5	2	5	0
Whooping-cough 4:																		
Males	5,375	1,381	1,634	722	335	233	535	137	142	82	30	20	32	27	26	28	5	6
Females	4,939	1,139	1,427	601	318	179	483	165	138	81	69	58	89	84	40	32	36	3
Diphtheria and Croup 8:																		
Males	1,677	87	179	228	195	159	428	145	89	44	35	31	33	14	6	2	2	0
Females	1,737	65	148	182	173	158	431	162	97	98	84	60	51	20	3	3	1	1
Influenza and Bronchitis 9:																		
Males	1,294	2,504	1,070	340	153	61	124	15	6	6	0	0	0	2	0	4	5	4
Females	4,975	2,679	1,292	471	174	130	179	15	11	2	2	2	1	3	2	5	3	4
Pneumonia 10:																		
Males	5,875	499	817	830	766	625	1,589	382	123	59	32	23	48	46	18	12	4	2
Females	5,754	359	717	757	693	555	1,707	117	134	92	72	46	83	62	36	12	9	3
Tuberculosis 11:																		
Males	20,777	2,794	1,065	522	285	180	512	382	685	626	572	686	1,834	1,917	2,159	2,933	3,564	31
Females	21,896	2,301	930	461	267	182	481	379	651	660	589	920	1,804	1,674	2,097	3,119	4,834	11
Syphilis 16:																		
Males	1,576	428	308	116	34	24	35	18	15	11	13	12	17	55	94	123	240	4
Females	1,450	356	247	104	30	19	35	9	11	19	17	16	15	53	77	129	277	3
Cancer 21:																		
Males	1,379	383	35	7	5	2	20	8	26	21	30	35	117	142	184	184	178	2
Females	1,195	388	41	12	3	3	9	13	19	28	27	30	87	111	121	148	149	0
Diabetes 22:																		
Males	492	50	80	42	52	30	81	62	32	19	10	9	11	7	7	3	1	2
Females	353	54	72	41	30	19	51	31	20	11	3	3	6	5	6	3	1	0
Acute Encephalitis 23:																		
Males	1,004	33	43	25	14	15	61	43	79	63	69	74	168	154	107	44	11	1
Females	935	22	40	29	16	17	51	47	72	83	75	66	128	136	90	50	12	1
Epidemic Meningitis 24:																		
Males	606	149	82	49	23	15	63	52	36	32	20	18	28	12	18	7	1	0
Females	410	101	44	32	21	16	49	38	16	15	11	13	13	17	8	11	5	0
Pneumonia, all forms 31-37:																		
Males	16,820	849	703	359	263	182	736	630	2,304	1,847	5,341	5,008	9,451	7,317	1,932	2,876	925	67
Females	11,968	722	611	348	236	181	611	1,115	1,590	6,719	5,985	4,611	6,370	3,803	2,776	2,115	1,019	60
Diseases of the Respiratory System 31:																		
Males	11,070	283	238	107	81	50	296	369	1,953	1,104	1,975	1,647	8,781	6,835	1,538	2,609	842	62
Females	36,710	252	193	105	79	56	271	852	1,142	6,245	5,629	1,288	5,815	3,186	2,469	1,855	913	57
Diarrhoea 38:																		
Males	4,877	992	66	29	10	9	36	22	46	158	229	308	93	957	636	345	90	12
Females	2,565	716	62	24	9	7	23	37	83	148	160	161	127	346	191	88	43	4
Nephritis 40:																		
Males	141	15	1	0	0	0	0	0	3	7	11	13	25	31	17	14	6	1
Females	622	20	3	0	0	0	2	2	55	129	137	93	138	32	5	1	0	0
Cancer and other Malignant Tumours 13-20, 22-30:																		
Males	37,452	37	42	42	36	28	97	78	149	191	314	508	2,309	5,821	10,188	11,063	6,512	37
Females	48,123	35	33	43	28	21	85	75	122	196	500	1,024	5,243	9,773	12,203	11,321	7,371	14
Pellagra 54:																		
Males	614	1	7	2	0	1	14	12	12	12	17	24	75	115	125	124	72	1
Females	1,631	3	2	2	3	2	10	15	61	136	153	153	366	275	202	170	67	10
Diabetes mellitus 57:																		
Males	7,502	13	20	21	28	13	90	133	178	166	178	215	515	1,030	1,902	1,995	994	7
Females	9,651	9	10	12	16	9	90	174	135	141	156	190	594	1,458	2,814	2,683	1,451	9
Cerebral Haemorrhage 74a:																		
Males	11,281	114	24	11	9	13	25	26	52	81	154	256	1,421	1,110	8,920	13,211	12,782	66
Females	11,932	62	18	11	1	3	31	36	67	71	116	269	1,610	1,555	8,007	12,177	11,820	10
Organic Diseases of the Heart 90:																		
Males	78,627	282	61	68	45	85	112	683	777	746	902	1,189	1,324	9,659	16,035	21,436	21,850	82
Females	72,596	237	61	51	52	61	503	711	778	812	976	1,238	1,973	7,813	12,110	18,896	23,783	75
Disease of the Respiratory System (Tuberculosis excepted) 97-107:																		
Males	66,313	14,264	1,451	1,780	830	490	1,375	728	1,410	1,722	1,710	2,145	5,711	6,447	6,941	7,632	8,704	70
Females	55,994	10,957	3,807	1,520	753	470	1,088	754	1,004	1,188	1,382	1,441	3,348	3,720	5,239	7,353	11,714	53
Bronchio-pneumonia and Capillary Bronchitis 100:																		
Males	23,476	9,072	2,619	926	444	238	473	192	191	248	234	311	870	1,068	1,457	2,102	3,018	13
Females	22,201	6,905	2,293	861	387	246	420	218	246	228	262	271	701	757	1,376	2,184	3,686	17
Pneumonia, Lobar and Unspecified 101:																		
Males	33,302	3,517	1,379	641	393	183	599	141	1,056	1,290	1,278	1,629	1,185	1,539	1,111	1,265	3,512	14
Females	25,216	2,744	1,151	492	288	192	522	143	656	825	954	999	2,267	2,161	3,1..	3,841	1,196	30
Diarrhoea and Enteritis 113-114:																		
Males	20,488	13,350	3,681	1,059	321	151	210	76	41	51	43	68	150	199	229	324	525	5
Females	17,171	10,389	3,168	884	283	152	210	68	49	68	58	78	140	195	237	136	758	2
Appendicitis and Typhlitis 117:																		
Males	8,304	31	17	93	89	108	632	768	866	711	640	632	1,387	1,161	720	366	116	9
Females	5,649	17	16	71	72	92	562	590	566	492	448	451	782	648	424	232	90	1
Chronic Nephritis 129:																		
Males	42,368	13	11	21	17	23	93	136	218	323	491	649	2,178	5,107	8,488	12,043	12,205	52
Females	37,919	7	13	17	18	17	96	185	269	381	558	841	2,913	4,723	7,149	9,719	10,963	47
The Puerperal State 143-150:																		
Females	14,801	0	0	0	0	0	0	51	1,460	3,002	3,334	3,040	3,738	159	1	0	0	16
Puerperal Septicaemia 146:																		
Females	5,539	0	0	0	0	0	0	14	581	1,301	1,353	1,105	1,129	19	1	0	0	3
Diseases of Early Infancy 160-163:																		
Males	34,689	34,689																
Females	25,825	25,825																
External Causes 165-203:																		
Males	67,405	1,178	1,012	955	769	709	3,099	2,886	4,290	5,386	5,661	5,417	11,089	9,372	6,977	4,864	3,156	187
Females	24,220	948	786	717	660	615	1,697	793	1,116	1,293	1,269	1,169	2,118	1,979	1,990	1,354	1,0..	36
Suicide 161-171:																		
Males	8,341	0	0	0	0	0	4	22	122	380	585	691	1,792	1,864	1,0..	9..	411	-
Females	2,752	0	0	0	0	0	0	13	176	281	304	306	568	493	377	154	77	3
Homicide 197-199:																		
Males	6,096	83	9	7	3	1	27	67	301	877	1,072	918	1,497	786	262	103	37	47
Females	1,461	65	10	7	9	3	24	23	159	275	256	202	225	116	52	22	6	3
Automobile Accidents 188:																		
Males	10,547	32	10	26	19	35	1,325	684	685	810	737	680	1,441	1,283	1,059	819	437	13
Females	3,610	25	36	27	10	19	591	191	248	208	190	166	374	367	405	354	174	3

age and sex distribution of deaths from the principal diseases in 38 States
ear 1923 is shown in Table *(c)* (inset).
se 38 States have an aggregate population of more than 95,600,000. The
ion of the population of these States by sex and colour and the number
in rural and urban communities are shown below. Cities having more than
opulation are classed as urban. All other communities are included under
" rural ".

ESTIMATED POPULATION OF 38 STATES, JULY 1ST, 1923.

	Total	Male	Female
.. ..	95,613,844	48,513,915	47,099,929
te	87,037,624	44,206,382	42,831,242
ured	8,576,220	4,307,533	4,268,687
0,000 or more :			
te	42,893,891	20,973,765	21,920,126
ured	2,837,423	1,351,737	1,485,686
e	44,143,733	23,232,617	20,911,116
ured	5,738,797	2,955,796	2,783,001

following table gives a comparison of the deaths and the crude death rates
principal diseases for the years 1923 and 1924, with the percentage of deaths
. During the last three decades, considerable changes have taken place
tive importance of some of the causes of death as determined by the number
es attributed to each cause.
death rates from typhoid fever, tuberculosis, diphtheria, malaria, scarlet
rrhœa and enteritis, and other diseases have decreased, while the rates for
f the heart, cancer, diabetes mellitus and cerebral hæmorrhage have increased.

(d) DEATHS, DEATH RATES AND PERCENTAGE OF DEATHS CAUSED BY THE DISEASES IN THE REGISTRATION AREA, 1923 AND 1924[1].

	1924			1923	
	Number of Deaths	Rate per 100,000 Population	Per Cent of Total	Number of Deaths	Rate 100,(Popul
Typhoid and Paratyphoid Fever	6,677	6.7	0.6	6,635	6
Malaria	2,441	2.5	0.2	2,736	2
Smallpox	874	0.9	0.1	131	0
Measles	8,517	8.6	0.7	10,450	10
Scarlet Fever	3,122	3.2	0.3	3,440	3
Whooping-cough	8,188	8.3	0.7	9,440	9
Diphtheria	9,316	9.4	0.8	11,733	12
Influenza	19,374	19.6	1.6	43,370	44
Erysipelas	2,458	2.5	0.2	2,593	2
Lethargic Encephalitis	1,441	1.5	0.1	1,966	2
Dysentery	2,946	3.0	0.3	3,118	3
Meningococcus Meningitis ..	964	1.0	0.1	1,026	1
Tuberculosis of the Respiratory System	78,096	78.9	6.7	79,534	8
Tuberculosis of the Meninges, Central Nervous System	4,014	4.1	0.3	4,010	4
Tuberculosis, Other Forms ..	7,614	7.7	0.6	7,188	7
Syphilis	16,248	16.4	1.4	15,811	16
Cancer	91,138	92.0	7.8	86,754	8
Rheumatism	4,548	4.6	0.4	4,064	4
Pellagra	2,347	2.4	0.2	2,352	2
Diabetes mellitus	16,453	16.6	1.4	17,357	17
Meningitis (non-epidemic) ..	3,366	3.4	0.3	3,652	3
Cerebral Hæmorrhage and Softening	91,941	92.8	7.8	87,707	9
Paralysis without specified cause	5,957	6.0	0.5	6,056	6
Diseases of the Heart	176,671	178.4	15.0	170,033	17
Diseases of the Arteries ..	23,278	23.5	2.0	22,085	2
Bronchitis	7,207	7.3	0.6	8,815	8
Pneumonia (all forms)	97,403	98.4	8.3	105,680	10
Other Respiratory Diseases ..	8,998	9.1	0.8	9,550	9
Diarrhœa and Enteritis (under 2 years)	27,566	27.8	2.3	31,444	3
Diarrhœa and Enteritis (2 years and over)	6,916	7.0	0.6	7,259	7
Appendicitis and Typhlitis ..	14,788	14.9	1.3	14,345	1

[1] Three tables showing the number of cases of certain communicable diseases reported in the United are to be found in *Epidemiological Intelligence*, No. 10, pages 91 and 92.

THS, DEATH RATES AND PERCENTAGE OF DEATHS CAUSED BY THE PRINCIPAL DISEASES IN THE REGISTRATION AREA, 1923 AND 1924 *(continued)*.

	1924			1923		
	Number of Deaths	Rate per 100,000 Population	Per Cent of Total	Number of Deaths	Rate per 100,000 Population	Per Cent of Total
Intestinal Obstruction ..	10,480	10.6	0.9	10,211	10.6	0.9
of the Liver	7,344	7.4	0.6	7,027	7.2	0.6
s	88,863	89.7	7.6	87,378	90.1	7.3
il Septicæmia	5,745	5.8	0.5	5,657	5.8	0.5
uerperal Causes ..	9,630	9.7	0.8	9,448	9.7	0.8
al Malformations and ases of Early Infancy ..	77,653	78.4	6.6	75,626	78.0	6.3
.. ..	12,061	12.2	1.0	11,287	11.6	0.9
e	8,420	8.5	0.7	7,878	8.1	0.7
Accidents	6,430	6.5	0.5	7,100	7.3	0.6
r Accidents	1,623	1.6	0.1	1,757	1.8	0.1
ile Accidents	15,528	15.7	1.3	14,411	14.9	1.2
ccidental Causes and Un-ified External Causes ..	52,164	52.7	4.4	50,863	52.4	4.3
defined Causes	109,646	110.7	9.3	107,402	110.7	9.0
n or ill-defined Causes ..	17,536	17.7	1.5	16,638	17.2	1.4
il	1,173,990	1,186	100	1,193,017	1,230	100

Population, 1923 : 96,986,371 ; 1924, 99,030,494.

) SEASONAL DISTRIBUTION OF DEATHS IN THE REGISTRATION AREA, 1923.

	Number of Deaths	Annual Rate per 1,000
Total	1,193,017	12.3
.. ..	120,007	14.6
.. ..	124,816	16.7
.. ..	122,880	15.0
.. ..	106,436	13.4
.. ..	98,327	12.0
.. ..	89,750	11.3
.. ..	86,743	10.6
.. ..	85,753	10.4
er-	83,689	10.5
.. ..	89,030	10.8
er	90,568	11.4
r	95,018	11.6

Population : 96,986,371.

Preliminary reports indicate that the death rate for 1925 in the United will not differ greatly from the rate for 1924. Sixty-nine cities had an ag death rate of 12.5 per thousand in 1924, and 12.6 in 1925.

4. *Infant Mortality.*

Since the establishment of the birth registration area in 1915, there has decided decrease in infant mortality in the United States.

(a) DEATHS OF INFANTS UNDER ONE YEAR IN THE BIRTH REGISTRATION 1915 TO 1923.

Year	Males	Females	Total	Dea Live
1915	43,818	33,754	77,572	
1916	46,790	35,944	82,734	
1917	72,192	54,758	126,950	
1918	77,736	59,911	137,647	
1919	67,580	51,420	119,000	
1920	73,737	55,794	129,531	
1921	73,582	56,006	129,588	
1922	77,105	58,123	135,228	
1923	78,309	59,950	138,259	

During the nine years covered by the above table, the birth registrat increased from 10 States in 1915, with a population of 30,936,179, to 30 S 1923, with a population of 79,952,425.

The difference between the infant mortality of the white and coloured the United States is shown in the following table.

(b) INFANT MORTALITY IN THE BIRTH REGISTRATION AREA, 1923.

	Number of Deaths under 1 Year	Rate per Live B
Total	138,259	77.
White	120,814	73.
Coloured	17,445	117.
Males	78,309	85.
Females	59,950	68.

Total Population : 79,952,425.

ıe age distribution of deaths under one year of age, the seasonal distribution e deaths, and the diseases or conditions responsible for most of the deaths are below. The figures are for the birth registration area for the calendar year 1923.

c) AGE DISTRIBUTION OF DEATHS OF INFANTS UNDER ONE YEAR, 1923.

Age	Number of Deaths
1 day	26,371
.. ..	7,908
.. ..	5,851
days	10,974
.. ..	8,799
s..	6,095
s, but under 1 month	4,825
1 month	70,823
th	11,478
ths	8,763
ths	7,587
ths	6,486
ths	5,939
ths	5,432
ths	4,963
ths	4,622
ths	4,429
ths	3,818
ths	3,919
:al	138,259

SEASONAL DISTRIBUTION OF DEATHS OF INFANTS UNDER ONE YEAR, 1923.

	Number of Deaths	Per Cent of Total
January	14,459	10.5
February	14,247	10.3
March	13,884	10.0
April	12,134	8.8
May	11,043	8.0
June	10,147	7.3
July	9,865	7.1
August	10,948	7.9
September	11,052	8.0
October..	10,772	7.8
November	9,612	6.9
December	10,096	7.3
Total	138,259	100

(e) DEATHS OF INFANTS UNDER ONE YEAR FROM PRINCIPAL CAUSES,

Diseases	Number of Deaths	Per Cent of
All Causes	138,259	100.0
Measles (7)	2,181	1.5
Scarlet Fever (8)	129	0.0
Whooping-cough (9)	4,272	3.0
Diphtheria (10)	689	0.5
Influenza (11)	4,000	2.8
Dysentery (16)	521	0.3
Erysipelas (21)	659	0.4
Meningococcus Meningitis (24)	211	0.1
Tetanus (29)	174	0.1
Tuberculosis of the respiratory system (31) ..	461	0.3
Tuberculosis of the Meninges, etc. (32) ..	669	0.4
Other Forms of Tuberculosis (33-37) ..	258	0.1
Syphilis (38)	1,346	0.9
Convulsions (80)	1,304	0.9
Bronchitis (99)	1,897	1.3
Broncho-pneumonia (100)	13,907	10.0
Pneumonia (101)	5,131	3.7
Diseases of the Stomach (111-112)	1,387	1.0
Diarrhœa and Enteritis (113)	20,702	14.9
Congenital Malformations (159)	11,250	8.1
Congenital Debility (160)	7,092	5.1
Premature Birth (161*a*)	31,973	23.1
Injury at Birth (161*b*)	8,249	5.9
Other Diseases of Early Infancy (162-163) ..	4,600	3.3
External Causes (175-203)	1,717	1.2
Unknown or ill-defined Diseases (204-205) ..	4,382	3.1
All other Causes	9,098	6.5

'ant mortality rates for 1924 in 27 States are shown in the following table. ures are provisional, as final figures are not available at the time of writing. n " includes cities of 10,000 or more population. " Rural " includes all other nities.

DEATHS OF INFANTS UNDER ONE YEAR PER 1,000 LIVE BIRTHS IN 27 STATES, 1924 (PROVISIONAL FIGURES).

State	Total	Urban	Rural
States	71.9	72.8	71.0
ia	67.3	62.4	74.4
icut	68.9	67.1	76.7
'e	95.2	90.9	99.9
	83.4	89.9	80.9
	71.1	74.6	65.2
	65.3	72.7	59.2
	80.7	88.2	77.3
d	86.3	84.6	88.5
a	72.2	75.5	67.9
ta	56.5	55.7	57.0
ppi	71.3	94.7	69.0
	65.8	71.9	63.7
a	55.2	67.5	51.0
mpshire	78.0	81.0	74.8
sey	70.0	70.3	69.4
'k	69.1	69.6	67.1
rolina	82.7	100.7	79.8
akota	66.7	67.5	66.6
	66.8	70.4	61.7
	53.3	51.4	54.6
vania	78.8	80.4	77.0
rolina	101.7	121.6	99.4
	70.3	78.4	68.6
	76.9	93.1	72.4
ton	55.8	51.6	60.3
n	66.5	68.6	64.9
g	63.8	73.1	61.3

5. *Birth Rates.*

The birth registration area was established in 1915, and it included 10 and the District of Columbia. In 1923, 30 States and the District of Columb included.

The following table shows the number of births and the birth rates fro to 1923 inclusive.

(a) LIVE BIRTHS AND BIRTH RATES IN THE BIRTH REGISTRATION AREA, 1915 T

Year	Population in Thousands	Number of Births	Births Popu
1915	30,936	776,304	2
1916	32,789	818,983	2
1917	54,771	1,353,792	2
1918	55,515	13,636,649	2
1919	61,483	1,373,438	2
1920	63,659	1,508,874	2
1921	70,426	1,714,261	2
1922	78,886	1,774,911	2
1923	79,952	1,792,646	2

During 1923, there were 921,020 male and 871,626 female births, givin males per 1,000 females.

The live births and birth rates in 28 States, with the number of legitima illegitimate, are shown in the following table. Data as to legitimacy are not a for two States (Massachusetts and California), which are included in the birt tration area. The second table below gives similar data for still-births. I tables, figures for white and coloured races are given separately for those State have a comparatively large coloured population.

E BIRTHS (LEGITIMATE AND ILLEGITIMATE) AND BIRTH RATES IN 28 STATES, 1923.

	Population in Thousands	Live Births	Rate per 1,000	Legitimate	Illegitimate
.. ..	72,123	1,623,236	22.5	1,585,413	37,823
iite	66,676	1,482,998	22.2	1,462,480	20,518
oured	5,448	140,238	25.7	122,933	17,305
.icut	1,476	30,731	20.8	30,364	367
:e.	230	4,540	19.7	4,364	176
of Columbia	476	9,006	18.9	8,476	530
ite	360	6,381	17.7	6,271	110
oured	116	2,625	22.6	2,205	420
.. ..	6,791	131,920	19.4	130,243	1,677
.. ..	3,013	65,534	21.7	64,665	869
.. ..	1,797	39,162	21.8	38,757	405
:y	2,463	64,739	26.3	63,721	1,018
ite	2,236	61,222	27.4	60,574	648
oured	227	3,517	15.5	3,147	370
.. ..	777	17,588	22.6	17,316	272
d	1,505	34,679	23.0	32,820	1,859
ite	1,256	27,809	22.1	27,290	519
oured	249	6,870	27.6	5,530	1,340
1.	3,978	93,066	23.4	91,632	1,434
ta	2,499	56,307	22.5	55,258	1,049
pi	1,791	42,923	24.0	39,808	3,115
te	854	20,909	24.5	20,723	186
oured	937	22,014	23.5	19,085	2,929
. .. .	611	10,468	17.1	10,313	155
a.	1,334	30,209	22.6	29,837	372
mpshire.	448	9,309	20.8	9,204	105
sey	3,379	74,689	22.1	73,761	928
k	10,844	230,349	21.2	227,566	2,783
rolina..	2,686	84,158	31.3	79,652	4,506
te	1,886	57,985	30.7	56,988	997
ured	800	26,173	32.7	22,664	3,509
. .. .	6,117	128,649	21.0	126,589	2,060
. .. .	823	14,987	18.2	14,804	183
ania	9,100	217,235	23.9	212,563	4,672
land	627	14,442	23.0	14,206	236
rolina..	1,745	44,271	25.4	40,530	3,741
te	869	22,929	26.4	22,454	475
ured	876	21,342	24.4	18,076	3,266
. .. .	477	13,650	28.6	13,537	113
.. .. ..	352	7,330	20.8	7,144	186
. .. .	2,398	64,255	26.8	60,615	3,640
te	1,700	44,588	26.2	43,673	915
ured	698	19,667	28.2	16,942	2,725
on	1,434	25,259	17.6	24,918	341
a	2,739	58,831	21.5	57,834	997
g	212	4,950	23.4	4,916	34

(c) STILL-BIRTHS (LEGITIMATE AND ILLEGITIMATE) AND RATES PER 100 BIRTHS

	Total	Legitimate	Illegitimate	Still-b per 100 Li
Total	63,988	60,898	3,090	3
White	53,546	52,140	1,406	3
Coloured	10,442	8,758	1,684	7
Connecticut	1,136	1,118	18	3
Delaware	173	158	15	3
District of Columbia ..	468	423	45	5
White	253	210	43	4
Coloured	215	213	2	8
Illinois	5,157	5,044	113	3
Indiana	2,029	1,977	52	3
Kansas	1,268	1,235	33	3
Kentucky	2,040	1,925	115	3
White	1,762	1,705	57	2
Coloured	278	220	58	7
Maine	748	728	20	4
Maryland	2,383	2,133	250	6
White	1,640	1,573	67	5
Coloured	743	560	183	10
Michigan	3,642	3,556	86	3
Minnesota	1,724	1,677	47	3
Mississipi	2,305	2,004	301	5
White	671	662	9	3
Coloured	1,634	1,342	292	7
Montana	307	296	11	2
Nebraska	911	893	18	3
New Hampshire	427	414	13	4
New Jersey	3,172	3,074	98	4
New York	9,829	9,631	198	4
North Carolina	3,441	3,076	365	4
White	1,815	1,753	62	3
Coloured	1,626	1,323	303	6
Ohio	5,010	4,828	182	3
Oregon	485	483	2	3
Pennsylvania	8,442	8,087	355	3
Rhode Island	492	484	8	3
South Carolina	2,587	2,198	389	5
White	837	806	31	1
Coloured	1,750	1,392	358	6
Utah	320	316	4	3
Vermont	232	226	6	3
Virginia	2,845	2,558	287	4
White	1,409	1,364	45	3
Coloured	1,436	1,194	242	7
Washington	680	667	13	3
Wisconsin	1,670	1,528	42	3
Wyoming	165	161	4	3

ıe birth rates in 27 States for 1924 in cities having more than 10,000 tion and in other communities are given below.

RTHS PER 1,000 POPULATION IN 27 STATES, 1924 (PROVISIONAL FIGURES).

State	Total	Urban	Rural
tates	22.5	22.5	22.5
nia	22.0	22.4	21.6
ticut	21.1	22.6	16.1
are	18.9	19.2	18.6
i	24.2	24.7	24.0
	19.9	20.5	19.0
a	22.3	23.3	21.6
	23.6	24.7	23.2
ınd	22.7	22.4	23.2
an	24.1	24.4	23.7
ota	22.0	24.2	20.7
ippi	24.3	27.5	24.0
ıa	16.1	21.0	14.9
ka	21.5	23.7	20.9
ampshire	22.5	25.6	19.9
ersey	22.3	23.9	19.2
ork	21.2	21.8	19.1
Carolina	31.6	30.4	31.9
Dakota	20.8	30.4	19.9
	21.1	21.6	20.5
	18.6	19.5	18.0
lvania	24.2	23.5	24.8
Carolina	26.9	26.6	26.9
nt	21.0	27.0	20.0
a	26.5	21.7	28.2
ıgton	17.4	18.9	16.1
ısin	20.7	23.5	19.0
ing	24.0	31.5	22.5

II. RECENT DEVELOPMENTS IN HEALTH LEGISLATION.

alth Legislation.—The legislatures of most of the States held regular sessions 1925 and much legislation was enacted. However, many of the laws which affected the public health were similar to laws which had been previously d in other States, and a complete review of the health legislation of the year be, in its general features, very similar to the review contained in the *tional Health Year-Book* 1924.

ıe following brief summary includes some of the subjects which attracted the on of legislators during 1925.

Oysters and Other Shellfish.—Outbreaks of typhoid fever in a number o during the latter part of 1924 emphasised the danger of using shellfish from p waters as food. As a result of the investigation conducted by the United Public Health Service and State Departments of Health, new laws or regulatio adopted in several States regulating the taking, handling and sale of oysters.

The regulations differ, but in general it is required that oysters must b from beds certified by the proper health authorities as not contamina sewage, and the certificates must be approved by the United States Public Service. Employees who shuck or otherwise handle the oysters must be medical examination and found to be free from diseases which might be conve the oysters.

The regulations adopted by the Department of Public Health of Illinois for chlorination of the oysters, although this is not required if other conditions a The chlorination is carried out by immersion of the oysters in salt water con chlorine, the object being to sterilise the outside of the shell and permit the by natural processes, to free itself of such infected matter as may be within t or body cavities.

The regulations also provide for keeping the oysters at a temperature Fahrenheit or below, and require cleanliness in packing, shipping, and ha

Prevention of Goitre.—A law passed in Wyoming gives the State Board of power to adopt " such rules and regulations as shall be necessary to regulate of domestic salt or prescribe such manner of treatment as has been found p to prevent goitre from becoming more prevalent ".

Regulation of the Practice of Midwifery.—The State Board of Health of adopted regulations governing the practice of midwifery by persons who a physicians. Applicants for licences are to attend classes of instruction complete a course of lessons prescribed by the board. They must also agree to promptly all births and to follow the instructions issued by the Board of After examination, successful applicants are given a licence, which must be r each year.

The instructions are explicit on many of the more important matters and that a physician be called in difficult cases. The midwife is forbidden to u instrument or drug to assist delivery.

Swimming Pools and Public Bathing Places.—The regulation of public swi pools and bath houses was the object of regulations adopted in several States 1925.

These regulations generally require registration with the health authorities State and the filing of a complete description of the pool and the method of ope The number of persons allowed to use the pool is limited and bacterial exami of the water at regular intervals are provided for. The attendance of persons su from communicable diseases is prohibited, and employees must be free fro diseases. A curb of concrete or other impervious material must be erected to water from running back into the pool, with scum gutters to carry off waste Shower baths must be provided, and all bathers are required to take a cl bath before entering the pool. Bathing suits and towels provided for the use of must be laundered after each use. Dressing-rooms, spaces for persons no the pool and toilets must be kept clean. The pools and all parts of the p are subject to inspection by the sanitary authorities.

Reporting of Communicable Diseases.—The State of Georgia adopted new tions governing the reporting of cases of communicable and occupational d

ians are required to report to the health authorities all cases of notifiable
:s treated or examined by them, giving the location, name of the patient, race,
d age. The report must be in writing and made within one week after diagnosis.
disease is cholera, diphtheria, encephalitis lethargica, measles, cerebro-spinal
gitis, plague, poliomyelitis, scarlet fever, smallpox, typhoid fever, paratyphoid
typhus fever, whooping-cough or yellow fever, the physician, in addition to the
1 report, must give immediate notice to the local health officer.
. reporting venereal diseases, the physician does not report the name of the
, but gives only the office number of the case, except when he has reason to
· that the patient is likely to expose others to the disease.
)cal health officers are required to send copies of all reports received by them
State Board of Health.

npounding of Water.—In order to prevent the creation of mosquito-breeding
which might cause malaria, the State Board of Health of Georgia adopted
ions governing the impounding of water or raising the level of existing ponds.
permit is required before operations are commenced, and another permit after
npletion of the work, but before the water is turned on or allowed to rise.
ea must be cleared of all debris or other materials which would be likely to
shelter for mosquito larvæ, and kept clear of such material during the mosquito-
ıg season. The shore-line must be cleared of brush, undergrowth and trees
istance of fifteen feet from high-water level. Trees and undergrowth which
project above the water must be cut off at least one foot below water level.
ressions which will contain water must be directly connected with the main body
ı channels. Small ponds or other places suitable for the breeding of top minnows
e provided. The State Board of Health is to inspect the impounded waters
jacent areas from time to time, and any conditions found to be detrimental
public health must be corrected by the permit-holder.

gulation of Practice of "Cosmetic Art".—Several States, by law or regulation,
ndeavoured to control the so-called "beauty parlours", which have rapidly
ed in number in the United States during recent years. A law passed in
sin in April 1925 is typical. This law provides for registration of all "cosme-
" by the State Board of Health, which issues a licence to applicants found
ualified after examination by a board appointed by the State Board of Health.
cences must be renewed each year, and the State Board of Health may revoke
nce or refuse to renew it if the holder is found to be unfit or has violated the
sanitary rules.

III. PREVENTIVE MEDICINE AND HYGIENE.

erculosis.

e decline in mortality from tuberculosis in the United States noted in the 1924
ook has continued. The death rate from this cause in the registration area
was 90.6 per 100,000 population. Preliminary studies made by the National
ulosis Association indicate that the 1925 death rate from tuberculosis will be
n 85 and 86 per 100,000.
e number of hospital beds for tuberculous patients has been augmented and
tals about 60,000 for Continental United States.
ere is an increasing tendency to care for patients in the locality in which
ıay live rather than transfer them to localities with climate reputed to be

especially beneficial. The American Medical Association notes that " an outsta and commendable movement on the part of hospitals " is the increasing ten to care for tuberculous patients in general hospitals, a movement which pr considerable relief, both medical and economic.

The trend of developments is toward the diffusion of knowledge among th regarding the importance of maintaining general good health and in the prev of other diseases. Intensive educational work among school-children and ind employees and by large insurance companies is an outstanding developm tuberculosis work.

In treatment, particularly of non-pulmonary tuberculosis, there is a r growing use of direct sunlight and of the various lamps used in heliotherapy. development of knowledge of the influence of sunlight and nutrition is expec have an important bearing on the prevention of tuberculosis. None of the remedies offered as curative has been found specific or of outstanding merit, an applies to preparations introduced from abroad, one of which in particular was the subject of extensive animal experimentation by the United States Public H Service. None of the recently developed vaccines has been found satisfacto prophylactic use in children.

2. *Cancer.*

As a cause of death in the registration area of the United States, canc advanced from ninth place in 1900 to fourth place in 1924 ; while of the total d the percentage of deaths due to cancer has increased in the same period from 7.75 per cent. And, according to recent investigations, this increase is largely a and not merely apparent, although some of it is due to the improvement i registration of deaths and in the precision of death certificates.

The following tables show, respectively, the ten leading causes of death in when the death registration area of the United States was first constituted (30,0 population ; 40 per cent of total) and in 1924 (when it included 99,000,000 popul or about 88 per cent of the estimated population of the country).

TEN LEADING CAUSES OF DEATH, 1900.

Cause of Death	Deaths	Per Cen Tota
1. Tuberculosis (all forms)	62,096	11.5
2. Pneumonia (all forms)	55,523	10.3
3. Diarrhœa and Enteritis	40,985	7.6
4. Heart Disease	40,631	7.5
5. Nephritis	27,377	5.1
6. Congenital Malformations and Diseases of Early Infancy	27,194	5.0
7. Accidental and Unspecified External Causes	25,877	4.8
8. Cerebral Hæmorrhage and Softening	22,018	4.1
9. Cancer and other Malignant Tumours	19,371	3.6
10. Meningitis	12,578	2.3

TEN LEADING CAUSES OF DEATH, 1924.

Cause of Death	Deaths	Per Cent Total
1. Heart Disease	176,671	15.1
2. Pneumonia (all forms)	97,403	8.3

TEN LEADING CAUSES OF DEATHS, 1924 *(continued)*.

Cause of Death	Deaths	Per Cent of Total
ebral Hæmorrhage and Softening..	91,941	7.85
ncer and other Malignant Tumours	91,138	7.75
berculosis (all forms)	89,724	7.62
phritis	88,863	7.56
ngenital Malformations and Diseases of Early Infancy	77,653	6.6
cidental and Unspecified External Causes ..	75,745	6.45
rrhœa and Enteritis	34,482	2.94
eases of Arteries, Atheroma, Aneurism, etc. ..	22,278	1.9

ring 1925, the Public Health Service published the results of its intensive f cancer mortality in the ten original registration States during the period , the object of which was to determine the amount of actual increase in the leath rate. Approximately 70 per cent of the reputed increase was shown ctual increase. In persons 45 years and over, deaths from cancer of the buccal ad increased 103.4 per cent ; cancer of the uterus, 64.7 per cent ; cancer of t, 82.6 per cent ; and cancer of the stomach and liver, 50.7 per cent.

ile the ætiology of cancer remains baffling, the increase in mortality has ed the assiduity of those engaged in cancer research. During 1925, the usetts Legislature directed the State Health Department to make a study of prevalence in Massachusetts, particularly with reference to the disease in its le stage and to the facilities for treatment. The report showed that there tween 9,000 and 9,300 persons suffering from cancer in the State (estimated ion, 4,127,653). A definite relation was indicated between density of popu- nd cancer incidence, the cancer rate increasing with population density from ral communities to cities which have about 4,000 inhabitants per square mile, ich point no further increase with increasing density was shown. A need ional hospital beds was shown for the care and treatment of cancer patients erminal stages of the disease.

hout definite knowledge as to the ætiology and specific methods of treatment an early diagnosis and prompt operation, no particular advances were made he year in prophylaxis or prevention other than an aroused general interest.

real Diseases.

a conference of Federal and State health officers engaged in venereal-disease work, in December 1924, the following resolution was adopted :

> "That greater efforts be made by official and voluntary officers to establish and demonstrate community procedures in medical treatment, education and measures for immediate disinfection."

wever, the trend toward advocacy of immediate disinfection of those exposed, sures found scientific and practicable, has not lessened activity in other s for the control of venereal diseases.

cial attention is also being given to arousing the interest of practising ns and medical students in the detection of obscure cases of venereal diseases he necessity for prompt adequate treatment. During 1925, the Public Health secured a valuable collection of views of syphilitic lesions in various stages,

from which there were prepared sets of strip film for use by State boards of h medical societies, medical schools, etc. These films have proved of great val stimulating interest in the detection and treatment of syphilis and in devel a fuller co-operation between physicians and health departments.

In addition to medical activities, the interest of social and correctional age has been stimulated in venereal-disease control work, not only in routine phy examination but in activities directed towards developing an effort to change the of sexual delinquents with a view to lessening their exposure to infection.

Reporting.—During the period July 1st, 1924, to June 30th, 1925, the State b of health of 47 of the 48 States received the following notifications of venereal dis (from all sources—clinics, penal and correctional institutions, and physicians in pr practice) : Total, 372,813 ; syphilis, 200,584 (53.8 per cent) ; gonorrhœa, 16 (44.4 per cent) ; chancroid, 6,706 (1.8 per cent). The total number of cases rep shows an increase of 2.1 per cent over that for 1924. The number of cases, how does not represent the total incidence, inasmuch as reporting is far from comp therefore, variations from year to year are of little significance except as an i of progress in detection of obscure cases and in reporting.

Reports from 495 venereal-disease clinics, including those operating under control of the Federal Public Health Service and State boards of health, show 11 admissions during the period July 1st, 1924, to June 30th, 1925—syphilis, 6 cases (56.7 per cent) ; gonorrhœa, 45,079 cases (40.8 per cent) ; and chancroid, cases (2.5 per cent). The number of treatments given was 2,088,494 ; dos arsphenamine, 521,993 ; Wassermann tests, 300,362.

4. *Malaria.*

In the prophylaxis of malaria, the only development, if it may be called such, during 1925 was the growing conviction among our malariologists that qu has little usefulness as a prophylactic. Careful observations of United S troops stationed in the Panama Canal Zone and of labourers in Central Am showed that quinine, administered daily in large doses, did not prevent ma infection, although it promptly cured a large percentage of recent infections. action is curative rather than, as was formerly believed, prophylactic.

The most important recent development in measures for combating ma is the perfection of methods for using Paris green as a larvicide. Paris green in minute quantities has been found to be intensely toxic to anopheline larvæ. small bodies of water it may be distributed by hand when mixed with road dust, part to one hundred parts, at much lower cost and just as effectively as oil. green is especially suited for use as a larvicide in dry countries where the water is relatively limited and generally confined to small ponds.

In the malaria region of the United States, the water area, in which the Anop mosquitoes produce, is large and it has heretofore been considered a physical im sibility to control malaria in this region through the destruction of mosquito but during 1925 extensive mosquito-breeding areas were kept under control by dus Paris green from aeroplanes.

An improvement was made in oil-spraying apparatus during the year, consis of an air tank, in which 250 pounds of pressure can be developed, which is atta to the oil tank. By the use of this apparatus, the oil is sprayed more rapidly and much greater distance than is the case with the use of the knapsack spray comm used. The new apparatus is operated from a boat, and will greatly facilitate treatment of large bodies of water.

e United States Public Health Service conducted special malaria investigations, as done during the past eleven years.

small group of Mexican labourers brought into the Mississippi delta to pick were found to have a high percentage of infection. The migration of infected bour was considered highly important to the agricultural interests of the South uth-West United States, and was made the subject of special study. It is red significant that malaria has recently appeared in the irrigated regions ne border between the United States and Mexico. The health problem involved o be determined.

o important activities of the individual States during 1925 having a bearing quito control are : (1) the organisation of county health units in the South development of interest by the county health officers in the malaria problem ; the improvement in the collection of malaria statistics.

homa.

ile trachoma is found sporadically throughout the United States, the principal prevalence, so far as the white population is concerned, are in the mountainous f Virginia, West Virginia, Kentucky, Tennessee, Southern Missouri, Arkansas stern Oklahoma.

e United States Public Health Service maintained three hospitals during 1925, ing been closed during the year. Treatment is furnished by these hospitals e hope of rendering the patient non-infectious, thus eliminating him as a focus tion. It is not thought that these few hospitals, with small capacity, can treat cases to eradicate the disease ; but it is believed that an appreciable result n observed in some sections, and that many sufferers are reached with the doctrine that trachoma can be cured if taken in time and that treatment a while.

e United States maintains a research laboratory in Missouri. A member of f of the Hygienic Laboratory is in charge of the work, and some noteworthy s has been made in trachoma research which will soon be published.

let Fever.

e use of biologic agents in the prevention and treatment of scarlet fever has mmediate, though as yet not general, acceptance by health officers in dealing is infection. These agents are utilised as follows :

The specific streptococcus toxin is used to determine individuals, among those , who are to be considered as susceptible to scarlet fever, so that they may be y watched for the development of the disease ; and (2) in institutions (and to xtent in the general population) the general prophylactic use of the toxin is serviceable.

e use of the antitoxic serum in the control of the clinical manifestations will, ped, reduce the period of infectivity and diminish the risk of communicating ease to others.

e serum is being used to some extent to induce passive immunity, but the of opinion seems to be against this.

ıgra Investigations.

1864, two cases of what was thought to be pellagra, with mental symptoms, ported by two physicians of New York and Massachusetts respectively. Exclu- one case reported in the State of Georgia and another reported by a physician

in Chicago, (Ill.), in 1902, the disease either did not occur or was overloo
the United States between 1864 and 1906-07, during which time its existence
country was authoritatively denied. However, in 1907 a number of cases of pe
were recognised and reported independently by medical officers of asylums
Southern States of Alabama and South Carolina. In 1908, the disease was ide
as pellagra by two physicians who visited Italy for the purpose of studying the d
Following these observations, pellagra was recognised as endemic in the United
and even highly prevalent in a considerable area, namely, the region south
Potomac and Ohio Rivers.

The recognition of this condition brought to light the fact that in this d
was a public-health problem of considerable importance. Serious as the pr
was at first thought to be, its seriousness greatly increased as American obs
realised that the knowledge of the ætiology and prevention of the disease wa
doubtful foundation. However securely based authoritative European opinion
have been with regard to the cause and prevention of pellagra, this was ser
questioned by American investigators, and the urgent need for the reinvesti
of the basic problems connected with the disease assumed a position of first impo
in the field of public-health activity in which the Public Health Service is speci
authorised to engage in its work of investigating the diseases of man.

The Public Health Service addressed itself to the study of these problems
soon after the recognition of the endemicity of pellagra in the United States, an
pursued this study ever since. The results of the investigations have been pub
in official and other publications. Without giving in detail a chronological ac
of the experimental work of the investigators, the results to date may be summ
as follows :

1. It has been demonstrated that pellagra may be completely prevented
appropriate diet (1) (2).

2. It has been experimentally demonstrated, by the successful production
disease in the human subject, that the disease is caused by diet (3) (4) (5).

3. It has been shown that there exists a significant difference in housefold
supply as between pellagrous and non-pellagrous households, the pellagrous h
a more restricted supply of such foods as lean meat, milk, cheese, and eggs (6)

4. Evidence has been adduced which has been interpreted as indicating tha
known dietary factors may be excluded from consideration as essential in rel
to the ætiology or prevention of the disease , and that a factor previously unrecog
or unappreciated, which has been designated as factor P-P, is primarily conc
in the ætiology and prevention of the disease (7) (8).

5. It has been shown that the pellagra-preventive factor (P-P) is prese
brewers' yeast, in milk, and in fresh lean beef, and is low or lacking in corn
dry soy beans, dry cow peas, butter, and cod-liver oil (7) (8).

6. Evidence has been adduced pointing strongly to the identity of black to
(the Chittenden-Underhill pellagra-like syndrome) of dogs and human pell
Substances that have been found to possess black-tongue-preventive potency

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(1) Goldberger, Waring, and Willets, *U.S. Pub. Health Rep.*, Washington, 1915, v. 30, 3117.
(2) Goldberger, Waring, and Tanner, *U.S. Pub. Health Rep.*, Washington, 1923, v. 38, 2361.
(3) Goldberger and Wheeler, *U.S. Pub. Health Rep.*, Washington, 1915, v. 30, 3336.
(4) Goldberger and Wheeler, *Arch. Int. Med.*, 1920, v, 25, 451.
(5) Goldberger and Wheeler, *Bull. Hygienic Laboratory*, No. 120.
(6) Goldberger, Wheeler, and Sydenstricker, *U.S. Pub. Health Rep.*, Washington, 1920, v. 35, 648.
(7) Goldberger and Tanner, *U.S. Pub. Health Rep.*, Washington, 1925, v. 40, 54.
(8) Goldberger, Wheeler, Lillie, and Rogers, *U.S. Pub. Health Rep.*, Washington, 1926, v. 41, 297.

ied in pellagra, been found efficient preventives of the human disease ; those d failed in pellagra or were of low pellagra-preventive potency, when tried tongue, have failed or were feeble as preventives of the canine syndrome (1).

Evidence has been adduced pointing to the probable identity of the pellagra-ive factor P-P and a factor heretofore included in the term "vitamin B", tinct from the antineuritic or beriberi factor (1).

l Sanitation and Rural Health Service.

eoretically, the United States is composed of individual self-governing repub-ar as local health matters are concerned, but practically, the health of any te or locality affects or may affect the wellbeing of the nation. Therefore well-established policy of the Federal Public Health Service to participate, demonstration and extension of financial aid, in the development and iance of efficient official whole-time rural health service.

1925, the Public Health Service co-operated in rural sanitation demonstration in 19 States. This work does not interfere with or relieve the States, counties cipalities of their proper duties, but is intended only to give a practical demon-of the possible accomplishments in rural sanitation and of the great value of uate local health service. It is done for the purpose of : (1) demonstrating ments in sanitation and sanitary devices ; and (2) determining the most and economical programme of health work for each particular community. 'ederal provision, the work can be done only in communities where the State or municipality pays at least one-half of the expense.

1925, about 16 per cent of the rural population of the United States was pro-ith a local health service under the direction of a whole-time health officer, ared with about 14 per cent in 1924. Of these whole-time rural health services, ent were receiving financial aid from their own State department of health e International Health Board or from the Federal Government.

ethyl Lead Investigation.

etraethyl lead compound, soluble in gasoline, has been produced by a commer-cern after many years of experimentation directed toward increasing the y of internal-combustion engines. The stimulus to such research came from that in this country it is estimated that only about 5 per cent of the energy ied from the gasoline used in automobile engines—95 per cent of the energy rown away. The manufacturers claim that the addition of small quantities lead compound to gasoline will increase the efficiency of present motors, with a specially designed motor it is possible to get from 50 to 100 per cent in efficiency. The economic factor is apparent when it is considered that n to 15 billion gallons of gasoline are used in automobiles each year in the States.

owing a number of deaths at one of the plants of a large oil company, which in connection with the manufacture of the tetraethyl fluid, the Surgeon-General conference early in 1925 to determine whether there was a public-health involved in the manufacture, distribution or use of tetraethyl-lead gasoline. of several experts indicated that there was a health hazard involved, and the -General appointed a committee to investigate further and report. The report ommittee was to be made early in 1926. In the meantime, the manufacturing voluntarily discontinued, temporarily, the sale of ethyl gas.

-DBERGER, WHEELER, LILLIE, and ROGERS, *U.S. Pub. Health Rep.*, Washington, 1926, v. 41, 297.

While the United States Public Health Service has no authority or juri regarding the inter-State shipment of substances such as this lead compoun though they are injurious to health, it is authorised to investigate and to inf public as to the result of its investigation.

10. *Research dealing with Biologic and Serologic Products.*

Considerable success has attended the work on the prevention and tre of scarlet fever (already noted).

There was also developed during the year a vaccine which, on the basis on laboratory animals, promises success in protecting human beings against Mountain spotted (or tick) fever. Field trials involving the vaccination of hundred individuals are now under way to test the practical utility of the already well established on experimental grounds.

11. *Alcoholism and Drug Addiction.*

The controversy between the proponents and opponents of prohibition United States has brought forth a mass of conflicting statements, and pro itself has introduced many new phases into the whole subject of drinking. The therefore finds it difficult to form definite conclusions regarding the preval alcoholism. A large insurance company reported a death rate from alcoho 2.9 per 100,000 among approximately 17,000,000 policy holders in the United and Canada in 1925, as compared with a rate of 2.8 in 1924 ; with 3.0 in 192 2.1 in 1922 ; with 0.9 in 1921 ; and with 0.6 in 1920. During the four years there were 1,657 deaths from alcoholism among this group of insured perso

The death rate for cirrhosis of the liver, which is closely associated with alco was 6.9 per 100,000 in this same group in 1925, as compared with 5.8 in 1924.

All available evidence indicates a decrease in the incidence of drug ad The severity of the narcotic laws and the increasing efficiency with which the are enforced are considered to have had a restraining influence on those who ot might have become addicts and to have stimulated addicts to seek a cure. of an increased number of narcotic agents, the amount of smuggled narcotic has decreased greatly during the past three years, probably owing in part to in international agreements for the control of traffic in narcotics.

12. *Maternity and Child Welfare.*

The infant mortality rate in 25 States decreased from 77.7 per 1,000 liv in 1923 to 71.9 in 1924. The infant mortality rate for 667 of the 700 (approxi cities with a population of 10,000 and over was 72.2 per 1,000 live births, as co with 78 in 1923. Among cities with over 250,000 population, the lowest r 45 (Seattle, Wash.) and the highest 92 (Pittsburg, Pa).

The death rate for 1924 from puerperal causes in the birth registration a 6.6 per 1,000 live births.

Four States were added to the birth registration area in 1925, making 3 and the District of Columbia now in the area.

Three additional States accepted the provision of the Federal Act pr funds for co-operative work in maternity and child welfare. There are now 4 co-operating with the Federal Government in this work.

A survey of midwives in Michigan revealed that 86 per cent had no prof training. An educational campaign was inaugurated.

Federal Legislation.—Industrial schools were established in Alaska, and a attendance law was passed for the District of Columbia making school att

ory between the ages of 7 and 16. Children of 14 years of age who have ed the 8th grade may obtain labour permits.

e Legislation.—The proposed child labour amendment to the Federal Con-, giving the Federal Congress power to limit, regulate and prohibit the labour ns under 18 years of age, was ratified in 1925 by the legislatures of three California, Arizona and Wisconsin.

:s relating to child labour were enacted in ten States. The laws concern ment of conditions under which children work, the shortening of hours, examinations, night work, and certain dangerous occupations.

higan and Vermont amended the laws of registration of births, deaths and :s.

a and South Dakota enacted a law licensing maternity hospitals under the f the State Department of Health, and requiring the attendance of a qualified ı at every birth in a maternity hospital.

nsylvania, Connecticut, Ohio and New York enacted laws relating to the education of children handicapped by surgical tuberculosis, impaired eafness or a crippled condition.

York State has officially substituted the expression " born out of wedlock " word " illegitimate ".

ana and Vermont authorised cities of certain classes to establish systems recreation, including playgrounds and recreation centres.

'al Hygiene.

925, the United States Public Health Service undertook an epidemiological mental diseases in the city of Boston during the two calendar years 1920 and ıprising a detailed investigation of the histories of more than 3,000 individual d including representative numbers of various racial stocks and types of iseases. The results will be published in 1926.

ng 1925, the Federal Government began the detail of medical officers of c Health Service to various consulates abroad to make physical and mental ions of prospective immigrants.

ral States passed laws relating to mental defectives. Laws providing for the on of the insane, feeble-minded, and habitual criminals were enacted in outh Dakota and Utah, and in Maine a law was passed permitting the on of certain cases of mental diseases and feeble-mindedness. Similar bills passage in Wisconsin, Ohio, New Jersey and Indiana.

Hampshire passed an amendment to a law regulating marriage of mental requiring the superintendents of schools to file annually with the State lealth the names of all epileptics, feeble-minded, imbeciles, idiotic and insane ho have left school or reached the age of 14 years during the preceding ıe names of such persons discharged or paroled from State institutions must led with the State Board of Health.

nsiderable extension of new institutions and clinics for the care of insane, ıded and epileptic persons was made in the following States during the year : ınia, Texas, Maryland, Illinois, Louisiana, California, Colorado, Ohio, ı, West Virginia, Massachusetts, New York and Florida.

na passed a law permitting any county having a city of 50,000 or more n to provide a detention home or hospital for the temporary care of the eble-minded or epileptic.

In Connecticut, a new department of psychiatry was organised in the U School of Medicine.

Arizona passed a law providing for the return to their State of legal resi non-resident public charges in Arizona and the return of alien public charge State Hospital for Mental Diseases.

Ohio, Pennsylvania and South Dakota made special provision for the e and care of mentally deficient children ; and in South Dakota, feeble-minded are not permitted to attend the public schools with normal children excep special classes are provided.

Visiting teachers, first employed in New York, Boston and Hartford in 19 number 186 in the United States, in 64 cities and 6 counties in 34 States. The teacher is considered a specialist in problems of abnormal children. She the child to find out what is wrong and informs the teacher or parents or socal

In methods of prevent ng delinquency, significant trends were evident duri viz., the increasing number of child-guidance clinics, not necessarily for de children but for all children in need of study ; the rapid growth of habit clinic pre-school child ; the development of travelling clinic service in the Stat departments ; and the introduction of psychiatric service in the public scho

There was an increasing tendency during the year to establish mental programmes in colleges for the purpose of conducting personality studies individual students. Three universities are seriously attempting organised hygiene work, with the aid of one or more psychiatrists on their staff individual students, through their own initiative, are seeking consultation.

The use of the words " insane ", "asylum " and " lunatic " are g disappearing as designations for institutions caring for mental patients, being replaced by the words " hospital ", or " school " or " home ".

14. *Public-Health Training.*

In general, the tendency in public-health training in the United States is tically at least, toward the recognition of the field of public health as a disti fession, although this tendency is not reflected in the increased number of enrolled in courses leading to a professional public-health degree. The re this is probably that, while health associations, health workers, and edu institutions recognise the value of special public-health training, the people a elected representatives who are in charge of State, county and municipal gover and who appoint the health officers, give little consideration to such training in their appointments. For this reason, as well as because there is no guar permanency in office, applicants are not stimulated to specialise in prof public-health training. It has recently been proposed by a member of the A Public Health Association, the membership of which represents every field of health endeavour, official and non-official, to license health officers, basing the of licences on minimum qualifications as regards the requisite knowledge, as in the case of physicians, nurses and dentists. For more than twenty years t of New Jersey has required licences for local health officers and sanitary ins and local boards of health have been prohibited from appointing health offic were not licensed by the State Department of Health. This would seem to way of ensuring greater competency in health officers.

The American Public Health Association believes that the cities and t of New Jersey have apparently profited by insisting on trained health officers of the opinion that we may look forward to the time when public health shall be sally recognised as a profession and a public service ; when special training

:d of every one seeking to enter the service ; when schools of public health n men in actual health-department practice as medical schools now train in the practice of curative medicine ; and when there will eventually be a nal unity and pride of service among all sanitarians.

le 1 shows that in 1924 there were 176 students enrolled and 91 degrees l in courses leading to a professional public-health career in the United States, ared with 165 enrolled and 80 degrees conferred in 1923.

TABLE 1.

OF STUDENTS ENROLLED AND DEGREES CONFERRED IN COURSES REQUIRING ST ONE YEAR OF RESIDENCE AND LEADING TO A PUBLIC-HEALTH CAREER, 1924.

School	Degree	Students enrolled, 1924	Degrees conferred, 1924
y of California	Dr.P.H.	0	0
	M.A.	2	1
	A.B.	5	4
iversity	Dr.P.H.	2	0
	Ph.D.	18	2
	C.P.H.	4	1
	M.S.	2	2
y of Louisville	(Health school closed)		
y of Georgia	Dr.P.H.	2	2
	M.P.H.	0	0
	B.P.H.	3	3
opkins School of Public Health	Dr.P.H.	26	14
	Sc.D.inH.	39	9
	C.P.H.	13	13
	B.S. in H.	7	3
School of Public Health	Dr.P.H.	6	5
	M.P.H.	5	4
	B.P.H.	1	1
setts Institute of Technology	Dr.P.H.	1	1
	Ph.D.	4	2
	S.B.P.H.	20	4
y of Michigan	Dr.P.H.	2	1
	M.S.P.H.	2	1
y of Minnesota Medical and uate Schools	M.A.	4	1
ollege of Medicine and Surgery	Dr.P.H.	—	1
y of New York and Bellevue ital Medical School	C.P.H.	—	8
e University	M.S.inP.H.	0	0
	M.S.	2	2
y of Pennsylvania School of ene and Public Health	Dr.P.H.	—	0
	Ph.D.	—	0
y of Iowa	M.S.	6	6
Totals		176	91

2 gives the total number of the various public-health degrees granted in d States in 1924.

TABLE 2.

DEGREES IN PUBLIC HEALTH GRANTED IN 1924.

Doctor of Public Health	..
Certificate in Public Health	..
Master of Science	..
Doctor of Science in Hygiene	..
Bachelor of Science in Hygiene or Public Health	..
Diploma in Public Health	..
Doctor of Philosophy	..
Bachelor of Public Health	..
Master of Public Health	..
Bachelor of Arts	..
Master of Arts	..
Total	..

IV. CURATIVE MEDICINE.

1. *Recent Developments in the Organisation and Operation of Hospitals.*

There has been a continued growth in the number of hospitals and a bet of hospital facilities through improved standards of diagnosis and treatment. mable hospital buildings are being gradually replaced by fire-resisting str

Dentistry has achieved a well-defined place in hospital practice. Insu analogous remedies have made out-patient treatment possible for cons numbers of diabetic and other patients formerly hospitalised. The field of soc in hospital practice is growing. There is an increasing demand for institut convalescents to facilitate discharge from hospital and bridge the gap betw ward and a return to industry. The tendency is increasing to omit small h for contagious diseases, especially tuberculosis, where general hospitals are a as a result of more accurate knowledge of the means of controlling infecti

A survey made by the *Modern Hospital Year-Book*[1] lists 6,694 hospital United States in 1925, not including institutions of 10 beds or less, with a 831,895 beds — 1 bed to each 136 inhabitants. The number of active beds lation is given as 1 bed to 236 inhabitants. According to a survey made American Medical Association, the total number of hospitals of all kinds and the United States in 1925, however owned and controlled, was 6,896 (not in hospitals of less than 5 beds capacity), with 802,065 beds (not including 34,511 ba a ratio of 1 bed to each 141 inhabitants[2]. Of this number, the Federal Gov operates 7.1 per cent, chiefly for disabled soldiers and sailors, or ex-service m women ; the State governments operate 40 per cent, the largest class of bene being insane and tuberculous wards ; county and city governments operate cent, largely for contagious diseases and indigents ; and private persons or corp operate the remaining 38 per cent.

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[1] 6th edition, 1926, The Modern Hospital Pub. Co., Chicago (Ill.).

[2] The figures presented here are not comparable with similar data appearing in the *International Health* 1924, the figures in which were taken from a survey of the Census Bureau and included only the hospitals

·pitals in the United States are very unequally distributed, and in few places provision for hospital beds kept pace with the constantly increasing demand, as resulted from the tendency for more persons to demand the best medical ·ir knowledge that a hospital offers the best facilities for providing this care, he increasing number of persons who can financially afford hospitalisation. .e gives a classification of the hospitals according to service.

TABLE 1.

OSPITALS (ALL TYPES, HOWEVER OWNED AND CONTROLLED) IN 1925 : NUMBER, CAPACITY AND AVERAGE NUMBER OF BEDS IN USE (EXCLUSIVE OF HOSPITALS OF LESS THAN 5 BEDS CAPACITY) [1].

	Type of Hospital				
	General	Nervous and Mental	Tuberculosis	All others	Total
)f hospitals	4,041	589	466	1,797	6,896
)f beds	293,301	341,480	49,131	118,153	802,065
ıumber of beds in use	193,743	322,342	39,669	73,608	629,362
ge of beds in use	66	94	80	62	78
ın per bed	386	332	2,310	960	141

number and capacity of hospitals for mental and nervous patients appears ·tionately large because the figures are supplied principally by large State ylums and other large institutions used principally for custodial purposes, them having in excess of 1,000 beds, the medical and surgical work being he general hospitals.

925, there were 2,648 hospitals administered by physicians, as compared 8 so administered in 1923. The number of registered nurses acting as ndents has increased from 1,283 in 1923 to 1,676 in 1925.

number of interns serving in hospitals is greater than that shown by any survey ; and the number of vacancies for interns is smaller.

following table classifies the hospitals according to ownership and control a comparison of the data for preceding years.

TABLE 2.

CLASSIFICATION OF HOSPITALS ACCORDING TO OWNERSHIP AND CONTRO
AND INCREASE SINCE 1909[1].

	1909		1914		1918		1923		
	Hospitals	Beds	Hospitals	Beds	Hospitals	Beds	Hospitals	Beds	Hospita
Federal ..	71	8,827	93	12,602	110	18,815	215	53,869	29
State	232	189,049	294	232,834	303	262,254	386	302,208	35
Non-Government ..	4,056	223,189	4,650	287,045	4,910	331,182	5,462	399,645	5,63
Hospital departments of institutions, ...	—	—	—	—	—	—	767	24,926	60
Total	4,359	421,065	5,037	532,481	5,323	612,251	6,830	780,648	6,89

2. *Sickness and Accident Benefit Clubs.*

The important agencies for health insurance in the United States are : mercial ; (2) fraternal ; (3) trade union; and (4) industrial establishment sic associations. In the last-named type the employees of an industrial estal contribute to a sickness fund, receiving in return cash benefits (and sometime attention in addition) when disabled by illness. The employer may or contribute to the fund. It is probable that a majority of these associations benefits only for illness and non-industrial accidents which incapacitate for n seven consecutive days. Benefits are not usually paid for industrial accide of the industrial States having compensation laws which cover such cas

The rules of the sick-benefit clubs vary. A large number of clubs requir cian's certificate stating the nature of the disabling illness. In most instanc fits are not paid for disability from venereal diseases, disability resulting from of any civil law, disability resulting from wilful or gross negligence, for sickness caused by chronic diseases contracted prior to joining the organisa for disabilities growing out of specific physical defects. There are also governing eligibility for membership.

Owing to the lack of a central agency for gathering the data, information these sick-benefit associations is difficult to obtain. The number in existen present time, their membership and the developments in their organisation a tion are unavailable. The data used in the *International Health Y* 1925, were made available through special studies. Information secure United States Public Health Service in 1925 from a group of sick-benefit ass co-operating with the Public Health Service in a study of disabling sick sample of the industrial population of the country showed a 4 per cent in membership during the year. This increase, however, may have been d increase in the personnel of the industries concerned.

[1] *Journal Am. Med. Assoc.*, vol. 86, No. 14, April 3rd, 1926.

:al Education in the United States.

quarter-century ending with 1925 marks an era of great improvement in education in the United States, probably unequalled by any other depart- education.

•r to 1900, little was generally known regarding our medical schools. In ır, the American Medical Association began the collection and publication which revealed a serious condition, and in 1904, the Association created a nt committee, the Council on Medical Education, devoted to the improvement :al instruction in the United States. In 1906-07, an inspection of medical)y the Council showed deplorable conditions. From that time on, and aided .0 by the Carnegie Foundation for the Advancement of Science, the American Association has carried on a successful campaign in raising the standards, v the large over-supply of medical schools[1] of inferior grade has given way to l supply of greatly improved, well-equipped and amply financed institutions.

important factor in raising the standard of medical instruction is the National f Medical Examiners, founded in 1915 by the president of the American Association. The purpose of the board has been to establish a standard ination and certification of graduates in medicine in the United States erritories and to secure the recognition of its diplomas by the State and il boards of medical examiners. (The medical licensure laws in the United xcepting for the District of Columbia, are under the control of the various The National Board gives its examinations at regular intervals. In 1915, ficate of the National Board was recognised by the licensing boards of 33 'orto Rico and the Canal Zone. It is believed that the other 15 States and rict of Columbia will soon enact legislation recognising the National Board e as an acceptable qualification for a licence in their jurisdictions.

iew of the fact that, whereas formerly the average student could master all ects taught in the medical schools, it is now impossible, and the student cialise, the tendency is to devise the curriculums primarily to furnish medical with a basic training, leaving the courses in special subjects to graduate

ain medical colleges have recently limited their enrolments in an effort further ve their medical instruction.

oblem that is now being considered is whether two or more years cannot be ring the physician's preliminary and professional education so that he can actice at a less advanced age.

925, there were 80 medical schools in the United States (the same as in 1924)— ectarian (*i.e.*, regular), 2 homœopathic, 1 eclectic, and 3 nondescript. Of ools, 74 are accredited institutions, while 6 are rated " class C ", and 5 of these ecognised by the licensing boards of 40 of the 48 States.

[1] *International Health Year-Book*, 1924, p. 481.

The following table gives data[1] regarding medical schools and student United States in 1925, as compared with certain prior years :

	1904	1919	1924	1
Medical schools in the U.S.	160	85	80	
Medical students in the U.S.	28,142	12,930	17,728	
Percentage of medical students graduating	20	20	20	
Average number of students per school ..	176	152	222	
Population of the U.S. (approximate) ..	75,000,000	105,000,000	112,000,000	113.(
Medical students per 100,000 population	37	12	16	

Of the 18,200 medical students in 1925, there were 910 women, 44 less than

In 1925, there were 147,010 physicians in continental United States, or mately 1 physician to each 770 persons, as compared with 1 to 724 in 1923, in 1919 and 1 to 640 in 1913. The State having the lowest proportion of ph to population was North Dakota, with 1 physician to every 1,386 persons, w State having the highest was California, with 1 physician to every 455 pers the District of Columbia the proportion was 1 to 242.

Distribution rather than supply of physicians is the problem that is now at attention in the United States. The proportion of physicians to population is apparently larger than would be necessary to offset the shortage communities.

From the standpoint of sociology, the main problem as regards medica to-day relates to readjustments whereby, under modern methods of educa practice, the benefits of modern medical training can be brought within the reach of the largest possible proportion of the public.

V. GENERAL.

1. *Federal and State Control of Foodstuffs, Drugs and Biologic and Serologic P*

Foodstuffs and Drugs.—Both Federal and State governments have pure f drug laws, the Federal Act applying to foodstuffs and drugs imported into the or shipped from one State to another, while the State laws apply only to fo drugs sold within the State. The latter in general follow the Federal law, a they are not uniform.

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[1] *Proceedings*, Annual Congress in Medical Education, Medical Licensure. Public Health and Hospitals Assoc., Chicago, 1925.

[2] *Journal Am. Med. Assoc.*, vol. 85, No. 8, August 22nd, 9125,

Bureau of Chemistry (Department of Agriculture), which administers the Food and Drugs Act, regards the purpose of the law as corrective rather than , and considers that the education of the food and drugs industries to comply law protects the public and legitimate industry more effectively than do g actions. Nevertheless, in those cases where educational methods fail, had to action in the courts. During the year ended June 30th, 1925, 910 were made and 746 criminal prosecutions were instituted for violations of the d Drugs Act. The major work in administering the food and drugs law was toward staple products, those peculiarly susceptible of adulteration or mis-, and those which, because of their high market value, offer particularly elds for sophistication.

ecial progress should be noted in the correction of a bad situation which existed lmon-canning industry prior to, during and just after the World-War. The nent has been uniformly successful in prosecutions and seizure actions brought lt of the canning of decomposed fish. During 1924, of 72 canneries inspected al and south-eastern Alaska, 13 were found to be packing or to have on their fish unfit for food purposes. During the 1925 season, of 71 plants inspected, were found to be holding or packing questionable fish. During the year une 30th, 1925, 25 criminal prosecutions directed against 17 packers were ed by the imposition of fines. These cases represented actions against who had in former years shipped decomposed salmon.

logic, Serologic and Analogous Products.—The Treasury Department, through lic Health Service, regulates the sale of viruses, serums, toxins and analogous in the District of Columbia and in inter-State commerce. On May 1st, 1925, re 36 domestic and 11 foreign establishments holding licences for the manufac-biologic products, a decrease of two domestic and an increase of three foreign ments as compared with the preceding year. These licences mean that ns of the establishments and laboratory examinations of samples of their are made regularly to ensure safe methods of manufacture, to ascertain freedom ntamination, and to determine potency of certain products. The licences mply endorsement of the claims made by the manufacturers.

potency of both the scarlet fever streptococcus toxin and the antitoxic based upon a unit described as the " skin test dose ". This is the amount given intradermally which will, in the average susceptible individual, give f redness 10 mm. by 10 mm. in 22 to 24 hours. This serves directly for the isation of the toxin, both for diagnostic and prophylactic purposes. The r therapeutic purposes is standardised by its ability to neutralise a certain of " skin test doses " of the toxin when the toxin and the antitoxin are mixed the body, held at 37° Centigrade for a short time, and then injected intra- into susceptible individuals. Unfortunately, the tests require the use of le human beings, no laboratory animal being suitable.

ng, Water Supply and Sewage Disposal.

le Federal activity was noted relative to housing during 1925, this being more closely concerning the States and municipalities. Widespread studies ng and rents were made, and special housing investigations were carried ny cities. The influx of negroes into Chicago added a housing problem to already present. New York is rebuilding antiquated tenement-house

sections ; and a housing corporation of Bayonne (N.J.) completed a group designed for rental to wage-earners.

The Supreme Court of Massachusetts held that the division of a city into and residential districts was not unreasonable, giving an impetus to zoning. the year, 86 additional cities adopted zoning ordinances, bringing the tota such ordinances to 422 on January 1st, 1926.

No outstanding developments were made in regard to water supplies d year. Liquid chlorine as a disinfectant has almost entirely displaced hypo In the process of purification, aeration has been provided in an increasing of plants. Iron removal and water softening were given more attention. Pre sedimentation for the removal of large particles before coagulation has come n use. Reports and surveys for large proposed water-supply projects were for the Boston Metropolitan District and Worcester (Mass.), and extensive were made at Los Angeles (California), involving the bringing of water f Colorado River through a 268-mile aqueduct at a cost of $150,000,000.

Some States and a number of cities took definite action prohibitin connections between public water supplies and polluted private supplies.

Iodising public water supplies for the prevention of simple goitre is no carried on in Rochester, New York, Minneapolis and Virginia (Minnesota), a Sainte-Marie (Michigan).

United States Public Health Service Drinking-Water Standards.—Durin the Surgeon-General of the Public Health Service proposed new standards for and culinary water supplied by common carriers in inter-State commerce standards were adopted and are for use in the administration of the Int Quarantine Regulations in safeguarding the public health in inter-State Common carriers are required to furnish drinking and culinary water for pa and crews in inter-State traffic which conforms to these standards.

In brief, the new standards require :

I. As to source and protection—

1. That the water be—

(a) From a source free from pollution ; or

(b) From a source adequately protected by natural agenci s f effects of pollution ; or

(c) Adequately protected by artificial treatment.

2. That the water-supply system be free from sanitary defects

II. As to bacteriological quality—

1. Not more than 10 per cent of all 10 c.c. *portions* examined sh the presence of organisms of the *B. coli* group.

2. Occasionally three or more of the five equal (10 c.c.) *portions* cons a single standard *sample* may show the presence of *B. coli*. Th not be allowable if it occurs in more than—

(a) Five per cent of the standard samples when twenty or more have been examined ;

(b) One standard sample when less than twenty samples have been examined. In the examination of any water supply the series of samples must conform to both the above requirements (1) and (2).

The *standard portion* of water for this test is 10 c.c.
The *standard sample* for this test is five standard *portions* of 10 c.c. each.

As to physical and chemical characteristics—

The water must be clear, colourless, odourless, and pleasant to the taste, and must not contain an excessive amount of soluble mineral substances nor of any chemicals employed in treatment.

ature of the development in sewage disposal during the year was the placing f large activated-sludge plants at Milwaukee, Wisconsin, and Indianapolis,

ioff tanks with sprinkling filters are still the main reliance although fine are rapidly coming into use. In several cities demonstration plants on a ial scale for de-watering activated sludge have been built, and several nt stations in the State of New York conducted research work into the l activities in Imhoff tanks and sprinkling filters under various operating as.

State Department of Health of New Jersey requires treatment-plant operators ensed.

c Health Propaganda and Education.

ublic health propaganda a distinction is made between the education of the d publicity for health work, the former having for its purpose the instruction dividual, inculcating in him proper personal and community health habits, publicity is intended to acquaint the people with the work and achievements agencies and to arouse popular sentiment and support. These branches of ropaganda necessarily overlap ; and, in achieving the desired results, both he same means, namely, the newspapers, bulletins, circulars, posters, exhibits, including radio lectures), motion pictures and other means.

function of the modern health official is conceded to be that of teacher as hat of administrator and policeman. Yet, in spite of the fact that popular struction is acknowledged to be one of the most significant factors in the modern alth movement, health education and publicity may be said to occupy minor rôle in administrative health practice.

ealth survey made during 1925 by the American Child Health Association d) showed that popular health instruction was the least developed and the vided for among the health duties of the health departments of 86 large cities 13 of these large cities conducting no work in this important branch of public- tivity. In order to remedy this deficiency in municipal efforts toward public- lucation, the American Public Health Association (composed of representa- n all fields of public health, official and non-official) approved a plan whereby office would supply, at a very moderate cost, health material for local use. this plan would require financing at first, it is believed that, once launched, become self-supporting.

The United States Public Health Service and the State departments o used many of the various means mentioned in instructing the public in health Practically all the States issued regularly printed or mimeographed bulletins a phlets on special subjects. The State commissioner of public health of Illinois for correspondence courses of instruction for prospective mothers. Othe sent " healthmobiles " on tour carrying health instruction to rural comm These " healthmobiles " also carried portable dental outfits as part of their eq

The United States Public Health Service issued 123 new publication the year ended June 30th, 1925, and distributed approximately 380,000 co also made loans of 4,500 stereoscopic slides on health subjects to universities an officials. The Public Health Service has been handicapped in this latt however, as no money has been appropriated for it for several years. Radio on health topics were given by the Public Health Service each month, and ne for newspapers and press associations serving the newspapers throughout the were issued at the rate of two or three a week during the year.

It must be said, however, that voluntary health agencies have been mo than official agencies in popular health education. Research and inves instruction and information, to supplement the work of official health agen within the proper scope of unofficial health organisations. Many large u agencies are better equipped to produce effective material for popular health tion than are official agencies. The life insurance companies spend large educating their policy holders in health protection and disease prevention b of attractively illustrated posters, pamphlets, calendars, etc., and they ha this work exceedingly profitable.

Washington, May 1926.

INDUSTRIAL HYGIENE

IN

BELGIUM, GERMANY and GREAT BRITAIN[1]

[1] The following reports were kindly supplied by the International Labour Office.

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I. Belgium

By Dr. GLIBERT,

Brussels.

change was made in 1925 in the official staff of this service, which includes :

An inspector-general, with the rank of Director-General ;
Nine medical inspectors ;
One woman inspector, holding the degree of Doctor of Medicine :
One inspector qualified as a Doctor of Science.

1. WORK DONE BY THE SERVICE.

(a) GENERAL HEALTH SUPERVISION.

ring the year 1925, the health officers inspected the general and individual ons of health in 2,697 works, factories and workshops, employing a staff of workers, 281,473 of whom were adult men, 90,848 women over 21, and 51,388 28,595 boys and 22,793 girls or women under 21.

the course of their numerous visits, the inspectors had frequent occasion for ing improvements in health conditions, both from the point of view of the tions and industrial processes and from that of the individual health of the .

e *Bulletin du Service médical du travail* (Industrial Health Service Bulletin) as many improvements that have been carried out.

(b) SPECIAL HEALTH SUPERVISION.

nc-white factories.—The prescribed monthly visits were carried out regularly ive zinc-white factories in the country. The results may be summed up as :

an average of 171 workers occupied in these establishments, the health rs found that 20 showed symptoms of lead-poisoning.

e of powdered zinc-white.—Every three months the inspectors examined the staff d in 11 factories where powdered zinc-white is used.

se establishments employ on an average 87 workers exposed to lead-poisoning. , 10 were suspected of incipient poisoning.

t factories (couperies de poils).—In the 23 felt factories, which employ about orkers, the doctors found 71 cases of mercurial poisoning involving no serious and also report 43 suspected cases of poisoning.

kylostomiasis.—33,514 working miners were examined when first engaged, hom were found to be infected.

second examination, held from the thirtieth to the fortieth day, covered workers, and six were found to be infected

en a further inspection took place, 947 were found to be infected, and 11 were be carriers of ankylostomiasis. Eleven were treated.

(c) Health Supervision of Minors.

This service is intended to ensure the normal development of young wor to give advice in all cases where medical care is desirable.

The regulations only require heads of firms to place at the disposal of th inspector a suitable room for the necessary medical examination, and gi the option of having the examination carried out by a doctor of their own upon condition that this doctor is approved by the Minister.

One thousand eight hundred and ninety-two factories have taken ad of this provision and have organised their health supervision with the hel or more approved doctors, of whom there are 900.

During 1925, 63,420 examinations were carried out of 36,275 boys an girls.

The official doctors carried out 15,375 examinations.

The approved doctors carried out 48,045 examinations. Supplementary nations were considered necessary in 7,221 cases, and were divided as follows

287 cases	(139 M. + 148 F.)	were re-inspected	every	month
1,907 ,,	(851 M. + 1,056 F.)	,,	,,	three m
5,027 ,,	(2,955 M. + 2,072 F.)	,,	,,	six mo

The principle disorders which necessitated direct intervention and constant advice were as follows :

	Cases
Spinal column :	
Cyphosis	7
Rachitic thorax	30
Skin and scalp :	
Eczema	9
Acne	7
Heart :	
Systolic murmur	14
Tachycardia	4
Respiratory organs :	
Pulmonary tuberculosis or pre-tuberculosis	13
Bronchitis	10
Digestive organs :	
Gastralgia	9
Mouth :	
Dental caries	622
Hypertrophy of the tonsils	175
Nose :	
Adenoid growths	41
Hernia, etc. :	
Hernia	32
Cryptorchidism	16
Varicocele	66

Nervous disorders :	
Endocrinic disorders	5
Exophthalmic goitre	1
Ears :	
Chronic otitis	2
Reduced hearing power	22
Eyes :	
Cyclopism	7
Strabism	11
Chronic blepharitis	38
Conjunctivitis	8
Corneal film (cataract)	30
Various :	
Tubercular adenitis of the cervix	9
Syphilis	1
Lead-poisoning	9

(d) First Aid.

n pursuance of a Royal Decree dated January 17th, 1921, all heads of firms are l to supply first aid for every worker who is seriously indisposed or injured execution of his duties.

his decree lays down that every industrial or commercial establishment must first-aid box with fixed minimum contents. In a certain number of cases, provides either for the erection of a special place for the application of first an arrangement with some approved medico-surgical institution. To date, industrial enterprises have entered into contracts with such establishments 52 medico-surgical institutions have been placed on the approved list.

uring 1925, the first-aid appliances in 1,966 industrial or commercial enter- were inspected; 1,565 possessed the regulation first-aid box, 127 establishments ted up a room for first-aid purposes, and 827 had made arrangements with an ed medico-surgical institution.

nally, 65 enterprises with underground works were visited by the health ors, who found everything in order.

(e) Laboratory Work.

n extensive special enquiry was undertaken in an industrial district near Brussels purpose of discovering the reasons for the destruction of vegetation, which was ted by the complainants to hydrochloric acid vapours.

n analysis was made of specimens of water from cisterns (rain-water) drawn ie district, down wind of the hydrochloric acid factory, and at various distances he works. The specimens were compared with those taken from rain-water strict where there is no industry.

sults.—A higher percentage of hydrochloric acid was found in the water in lustrial district, increasing nearer the factory.

ie condensation apparatus in the factory in question was next examined and analyses of the fumes were made. As a result, various improvements were

made in the apparatus, and the quantity of water passing over the conden columns was checked by pumping with electric pumps fitted with meters.

In pottery works, the laboratory carried out tests for lead in a large n of frits.

Results.—The presence of white lead was discovered in several frits sold as free from lead.

In consequence of complaints about the use of colours by means of pulv in painting tramcars, the laboratory undertook a series of analyses which the absence of lead in these colours.

An interesting enquiry was undertaken in a grenade factory, to discov possible emanations of lead vapours in the course of operations which consist of p into moulds an alloy kept in fusion at a very low temperature in crucibles. shown that this operation did not give rise to any escape of fumes.

The preparation of the alloy by the fusion of the three constitutent me carried out at the same works. The temperature when verified was found to be which is below the temperature necessary for the production of lead vapours.

The alloy when analysed was found to be free from arsenic.

A test for lead in the air of the hall of the reduction furnaces in a zinc f proved that this metal was only present in negligible quantities.

On the other hand, the presence of carbon dioxide in the same establish was found to be 10 cc. per cubic meter of air during the period of reduction.

During the cleaning of the furnaces, not even traces were discovered.

At the end of 1925 the laboratory started an extensive chemical enquiry in amount of carbon dioxide contained in certain industrial atmospheres; this w still in progress.

Doubts had arisen with regard to the composition of a powder used in cem iron, but analysis proved the absence of potassium cyanide.

A number of analyses made of waste water proved that certain complaint unfounded, whilst others called for action. This was the case, for instance,

(1) Waste water from dye works where the decantation was inade the decantation was augmented and improved by the precipitation and sulphate of iron;

(2) Waste water from paper mills, where it was found necess increase and improve the decantation.

The analyses of drinking water revealed no cases of impurity.

In pursuance of the Royal Decree dated April 14th, 1924, obliging brick to add at least 5 per cent of lime to the coal used in baking bricks, the propor lime in the coal employed in the brick works was tested.

Results.—Out of forty samples which were analysed, only nine contain required 5 per cent of lime.

The laboratory being responsible for the supervision of the matches ex to the United States, carried out tests for white phosphorus. These tests, involved the sampling of 2,503 cases, each containing 50 bales of 12 packets boxes, did not reveal the presence of white phosphorus in any sample.

2. WORK IN PROGRESS.

Independently of a series of private enquiries, the service has devoted attention to preliminary investigations with a view to regulating the deratisati the delousing of ships with hydrocyanic acid.

. has continued its work on a preliminary draft law on compensation for damage . by occupational diseases, and on a draft regulation protecting pregnant women ursing mothers engaged in industrial employment.

3. COMMISSIONS.

Mines Commission on Sanitary Conditions in Zinc Factories.

ıe Industrial Health Service has actively co-operated in the work of this Com- ı, chiefly by the organisation of a medical enquiry, the results of which were ıed in the *Health Service Bulletin*, Nos. 3 and 4, 1923, page 92 *ff.*
ıe work of the Mines Commission led to the promulgation of a Royal Decree, March 1st, 1925, also published in the *Industrial Medical Service Bulletin*, Nos. 2, 1924-25, page 1.

rary Technical Commission for the Investigation of Industrial Smoke in the Hemixem District.

ıe work of this Commission was carried on throughout 1925.

rary Commission for Technical Investigation of the Use of Zinc-white and Other Compounds of White Lead.

ıis Commission drew up the final text of a preliminary Bill which was published *Industrial Medical Service Bulletin*, Nos. 3 and 4, 1924-25, page 1. This Bill ınformity with the Draft Convention adopted in Geneva by the International ' Conference in 1921.

TERCHANGE OF MEDICAL OFFICERS, SPECIALISTS IN INDUSTRIAL HYGIENE.

January 1925, the Health Committee of the League of Nations, in compliance proposal made by M. Albert Thomas, Director of the International Labour decided to organise during 1925 an exchange for a group of industrial and labour ors and officials of the central or provincial administrations who had specialised ıstrial hygiene and pathology.
.e programme included a stay in Belgium long enough to admit of a careful ' on the spot into the general conditions of industrial hygiene in the country.
.e programme of investigation was divided into two parts. The first covered ical instruction with regard to the social institutions of the Kingdom. For rpose, lectures were given to the visitors by the best qualified authorities.
e second part of the programme included the inspection of a large number of aried institutions of particular interest for specialists in industrial hygiene.
e lectures given in the course of this interchange and an account of the ions carried out were published in the *Industrial Medical Service Bulletin*, and 2, 1924-25.

II. Germany

By Dr. Leymann,

Berlin.

The great activity shown during the last few years in Germany in in health was continued during 1925.

LAWS AND DECREES ENACTED BY THE REICH.

Among the legislative measures taken by the Reich, mention should b in the first place of those which put the principal occupational diseases on th footing as accidents occurring in the course of employment. It is true tha long time past all *acute* industrial diseases, such as poisoning, infections and t and also *occupational diseases* which take some time to appear, such as inflam of the tendinous sheaths, œdema of the knee, etc.—provided the lapse of tin not exceed the duration of a day's work—have been regarded in Germany as a and have been compensated as such, but this has not been the case with re other occupational diseases.

In this respect a change has been made, for in virtue of the Decree of th Minister of Labour, dated May 12th, 1925, the following eleven occup diseases were placed on the same footing as accidents for purposes of insuran compensation as from July 1st, 1925 :

1. Diseases caused by lead or its compounds ;
2. Diseases caused by phosphorus ;
3. Diseases caused by mercury or its compounds ;
4. Diseases caused by arsenic or its compounds ;
5. Diseases caused by benzol or its homologous compoun diseases caused by nitrogen and amide compounds of the aromatic (series ;
6. Diseases caused by bi-sulphide of carbon ;
7. Cancer of the skin caused by soot, paraffin, tar, anth pitch and the like ;
8. Glass-workers' grey cataract ;
9. Diseases caused by X-rays and other radio-active subst
10. Miner's helminthiasis ;
11. " Schneeberg " pulmonary disease.

The Decree further stipulates which enterprises are obliged to insure v against these diseases. Its stipulations apply to all enterprises in which the workmen are exposed to the effects of the substances causing the occupational d mentioned under Nos. 1 to 7 ; but they only apply to glass-works, to enterp which the workers are exposed to the action of X-rays, etc., to mining ente and to the metal mines in the district of Schneeberg (Saxony) in the case of No 10 and 11 respectively.

This Decree has very appreciably improved the position of workers su from an occupational disease. The German legislation on social insuranc however, already provided for compensation in such cases.

:cording to the provisions in force, the sickness insurance funds must first of vide for the care of the sick up to the twenty-sixth week of illness. After the ion of this period, the invalidity insurance or employees' insurance funds responsible, but only if the member has already paid his contribution for a time, and only if his disablement reaches a certain degree. Accident insurance s, however, are also paid in respect of a lower percentage of disablement and ns paid are on a larger scale than invalidity benefits. Accident insurance :fore more advantageous to the insured. Accordingly, for a long time past, have been made by the members of these funds to get occupational diseases on the same footing as accidents, and have now achieved success.

ımediately after the Decree of the Reich Ministry of Labour, the Insurance ment of the Reich on June 24th, 1925, issued a notice and decree laying down ions with regard to the declarations to be made both by the employers and ; the individual States also issued executive regulations, so that the Decree ıto force without friction. Certain particulars are already to hand with regard number of occupational diseases in respect of which such declarations have ade. The Official Accident Insurance Board of the chemical industry received, :he end of 1925, 272 declarations with regard to occupational diseases. Sixty : cases were cured in less than four weeks, twenty-six in four to five weeks, -two in five to six weeks and forty-three in six to thirteen weeks. No further had to be taken in any of these cases as the payment of relief was entirely in ıds of the sickness insurance funds. Of the 121 other cases, 47 not were yet 51 were not recognised as occupational diseases, and only 23 were recognised as ıs regards the last 23, compensation was held to be payable only in seven nd was refused in the other 16. Of these seven cases, four were due to lead- ng, one to mercury and two to bisulphide of carbon.

ese figures can, however, only serve as a rough indication and cannot be regarded ıg a reliable view of the number of occupational diseases in respect of which ısation is payable, as the period of time covered is too short.

ticle 7 of the decree at present in force in Germany with regard to the hours : of industrial workers and employees stipulates that, in the case of branches stry or groups of workers exposed to special dangers as regards life or health, ulation period of eight hours a day may not be exceeded, either in virtue of ve agreements or of administrative authorisations, unless such an increase ıtly necessary in the interests of the general welfare or unless it has been by long experience not to have any ill effects ; in any case, it must not half-an-hour. Among workers exposed to special dangers to life and health, / includes coal-miners working underground and workers who are particu- :posed to the effects of heat, poisonous substances, dust and the like, or to s from explosives.

e Reich Minister of Labour has to decide to which branches of industry or of workers this restriction applies. In a Decree dated January 20th, 1925, ded that it should apply :

1. In coke factories (whether attached to mines and blast furnaces or independent), to those workmen who are employed on the coke furnaces, including those who introduce the coal directly into the furnaces and those who withdraw the coke directly from the furnaces.

2. In foundries, to those workmen who are employed on the blast furnaces, including those who introduce the coke, ore and flux directly into the furnaces, and those who withdraw the molten iron directly from the furnaces or remove the pig-iron from the smelting yards.

Negotiations are being actively carried on for extending these provisions t industries, but no decision has yet been taken.

By a Decree dated May 28th, 1925, the period of application of the pr regarding the employment of women and adolescents in rolling-mills and for extended to March 31st, 1927. These provisions lay down that the employ women and children under 14 years of age is prohibited in rolling-mills an working with continuous furnaces. With regard to the employment of you in rolling-mills and forges which work *iron* and *steel* with continuous furnaces, exceptions are allowed to the restrictions which otherwise apply. Special per has to be applied for in each case. Such permission can only be granted, h for the employment of young men in work which is of a nature to assist professional training and which does not endanger their lives or health.

Examinations and Enquiries.

At the instigation of the Reich Ministry of Labour, various examinati enquiries, to which further reference will be made below, have been carried o regard to the health conditions of workers in certain industries or occupation Health Office of the Reich has always co-operated in these enquiries, and the Board of the Reich, which is attached to the Health Office has drawn up a on the health conditions of workers in the ceramic industry, and another on treatment of occupational diseases on the same footing as accidents.

The Labour Administration Department, which is under the Labour M of the Reich, has also displayed considerable activity in the protection of during the year under consideration. It has endeavoured by the publicati distribution of pictures giving a striking representation of the consequences dents and occupational diseases, to bring this matter prominently before the and to persuade them to pay greater attention to the dangers to which they are and themselves to co-operate in combating them. With the same purpose i it has arranged lectures and courses of instruction at the permanent industrial exhibition, and publishes a monthly special edition of the *Reich Labour (Reichsarbeitsblatt)*, which is exclusively devoted to the protection of the wo

Decrees and Instructions issued by the States.

In 1925 various decrees dealing with matters of industrial hygiene were in the individual German States.

In Prussia, for example, very detailed executive regulations were prom on March 25th, 1925, in connection with the Decree of February 13th, 1924, re hours of work in hospital establishments. This decree allows the nursing hospital establishments to work sixty hours a week exclusive of intervals In this way the nursing staff may be divided into two shifts, if intervals t two hours are allowed in each shift. The executive regulations determine wh the competent authorities and provide for measures of supervision. In so hours of work are concerned, this supervision is exercised jointly by the in inspectors and public health officials.

Special attention has been given in Prussia to the protection of women in trial undertakings before and after child-birth. The industrial inspectors had been given instructions on October 27th, 1924, to confer with the district

ı welfare workers in the Kreise and towns with a view to providing more ve protection for women before and after child-birth. A further Decree, dated 22nd, 1925, again drew the attention of the industrial inspectors, particularly of the female sex, to the necessity of protecting women before and after child- ınd instructed them to see that the latter, when working, should be treated with ecial consideration due to their condition. They should not be exposed to fects of heat, steam and unhealthy odours. As work involving standing or g about is a particular hardship for such women, they should not be employed k of this kind. Seating facilities should be provided to enable them to rest ime to time. In addition, owners or directors of undertakings employing a number of women should be urged to have a doctor in attendance at the . Lastly, rest-rooms should as far as possible be available, medicaments be kept in readiness, and measures taken to ensure sufficient nourishment.

ith a view to ensuring the more effective application of the laws on the tion of children, the schools are asked in Prussia to co-operate with the ities and to send in to the industrial inspectors a list of the children employed calling. By a Decree dated February 21st, 1925, the Minister of Trade and ry informed the industrial inspectors that lists would in future be communi- to them quarterly. In this way, thorough supervision of children employed ıstrial work is ensured.

ovisions and instructions similar to those in force in Prussia have also been lgated in the other German States.

ıe Reich Minister of Labour has issued a memorandum on the treatment of -monoxide poisoning as a consequence of fire-damp and coal-dust explosions es *(Reichsarbeitsblatt*, p. 509, No. 43, 1925).

ıe Minister of Labour of the Reich has also issued fresh instructions for the ction of animal hair by steam or boiling. These instructions apply to animal eated in horse-hair spinning mills, hair and bristle dressing establishments, ush factories, etc.

Labour Inspection.

ıe factory- and labour inspectors, including the medical inspectors, displayed eatest activity in 1925 in promoting the improvement of health conditions ustrial enterprises—a fact to which the annual reports bear witness. In 4 they also sent in reports on the health conditions of workers in the acid es, and in 1925 on the injury to health suffered by typists owing to the nature ıration of their work and the measures most likely to prevent such injury.

the years 1924 and 1925, thorough investigations were made with the active nce of the labour inspectors and particularly of the medical inspectors regarding alth conditions of acid workers, glass-workers and masons.

ıe medical inspectors—eight in all—have joined hands for the purpose of closer ration. On their own initiative, they drew up a report on the duration of ıls of rest during working hours, which they submitted to the competent ities.

ıe reports of the Prussian medical inspectors for 1925 have not yet been published, ose of the other medical inspectors contain many valuable observations and tions.

Works Committees (Betriebsräte).

ıe works committees and other bodies representing the workers employed ıstrial undertakings are increasingly giving their attention to the protection lives and health of the workers. According to the reports of the industrial

inspectors, they have in the majority of cases taken part in the inspections and often made valuable suggestions for removing abuses. There is every reason to that this co-operation will produce excellent results.

Associations, etc.

Among the societies and associations which devote themselves to prom industrial health, special mention should be made of the German Industrial Hy Society *(Deutsche Gesellschaft für Gewerbehygiene)*. In addition to represent of the principal authorities of the Reich and of the States, it includes represent of the central federations of employers and workmen, of the official accident rance boards and of the sickness insurance funds (the two latter being respo for social insurance), and it also numbers among its members the most prom experts on industrial hygiene and accidents. The considerable expenses o society are met by contributions from the authorities, the employers, the w (trade unions) and the insurance organs.

Since 1924, this society has published at its own expense a journal dealing industrial hygiene and protection against accidents, in which a great numb interesting articles appeared in 1925. Ten important articles have been publish separate pamphlets, including :

Dust in Industry : Its Influence on the Health of the Workers, and Progress as regards its Prevention and Removal, by Lehmann, Enge Wenzel ;

Industrial Carbon-monoxide Poisoning and its Prevention, by Dr. Heu and Dr. Forstmann ;

Medical Notes on Occupational Poisoning and Injuries caus Chemicals, by the factory practitioners of the German Chemical Factori

The Dangers of the Metallic Lead Industry, with Special Refere Lead Soldering, by Dr. Engel, Berlin.

With a view to popularising and developing knowledge of industrial hy the society organised courses of study and lectures, and, in co-operation wit Central Committee for the promotion of medical continuation courses, it arra an advanced medical course at Halle-on-Saale, which was attended by many m practitioners and medical officers ; a series of lectures was also given at Col Nuremberg, Essen and Frankfort-on-Main. These series of lectures, which, rule, covered from two to three days, were well attended by employers, man and workmen. In 1925, the society organised the first German technical exhibit industrial hygiene and accident protection at Essen, which was held in Septembe October under the title " Health and Labour " and was visited by a large nu of persons.

Home Trades Exhibitions.

With the enthusiastic co-operation of the trades unions, an exhibition of dom industry was held at Berlin showing the various changes introduced since the exhibition in 1913. As a general rule, skilled workmen engaged in domestic indu whose wages are usually fixed by collective agreements, earn approximate much as those working in factories. Nevertheless, the wages earned are some very low, but it is stated that in many cases the persons affected are of gr mpaired labour power or of poor capacity.

III. Great Britain

By Sir Thomas Legge, M.D.,

Senior Medical Inspector of Factories, London.

wide-reaching subject is perhaps best dealt with by reference to :

(1) The work of the Factory Department of the Home Office (as given in the Annual Report of the Chief Inspector of Factories) ;

(2) The work of the Industrial Fatigue Research Board (as given in the Sixth Annual Report of the Board) ;

(3) The work of the Miners' Welfare Fund ; and

(4) The activities of private associations, such as the Industrial Welfare Society, and the Welfare Workers' Institute.

urally, many other departments, such as :

(a) The Coal Commission (with its Medical Committee) ;

(b) The Explosives Department ; and

(c) The Ministry of Health ;

their particular functions, but they do not intervene in matters of industrial is directly as those named. Further, the Home Office administers the Work-mpensation Acts of 1906 and 1923, with which is related the Silicosis Acts and 1924.

FACTORY DEPARTMENT.

inistration of the Factory and Workshop Acts is carried on under the direc-he chief inspector, three deputy chief inspectors, 186 factory inspectors (of are women), five medical inspectors (of whom one is a woman), five engineer-ctors, and five electrical inspectors, distributed throughout Great Britain isions and 83 districts.

chief inspector's report states that the number of registered factories is and workshops 128,793. He notes that the centrifugal movement of indus-n the old and cramped surroundings in larger towns to the outskirts continues ecial feature. This is especially noticeable around London. The increasing rasive wheels has been a noticeable feature of the year 1925, particularly trades in which grinding was formerly performed by natural sandstones. from abrasive wheels is believed to be much less injurious to health than andstones, because it contains little or no free silica.

Factory Act makes provision for regulations for dangerous or unhealthy s, and under the recent Chemical Regulations during the year four classes er, box, or army type of breathing apparatus were submitted by one firm d and approved in accordance with the regulations for use : (1) in connection d gases, (2) in connection with ammonia, (3) in connection with organic (4) in connection with nitrous fumes only. Approval is also given to types ntained breathing apparatus approved by the Mines Department for use in at is, apparatus in which respiration is carried on entirely by the supply

of oxygen or liquid air for a certain length of time. Two of the inspectors ha detailed off to take readings of the amount of illumination in use for the processes in various trades during the winter months.

HOURS OF WORK.

The 48-hour week appears to be almost universal, and the factories i the 60 hours of employment (still permissible by law) are regularly worked are b rare. A five-day week has been introduced into a number of factories, and, has been adopted, the workers, and indeed the managers, seem to be almost sally in favour of it. The managers say that young workers seem much fresh they have the long week-end holiday, and to married women it is a boon.

VOLUNTARY WELFARE.

While statutory welfare must remain limited, there is virtually no l voluntary welfare. The report gives a remarkable instance of a large ass in the fine cotton spinning trade which, in their various factories, have 30 superintendents supervising schemes providing for :

(a) First aid and ambulance ;

(b) Messrooms ;

(c) Protective clothing ;

(d) Lockers for outdoor clothing ;

(e) Seats ;

(f) Washing accommodation ;

(g) External welfare (formation of football, hockey, and swi clubs) ;

(h) Sick benefit and pension scheme ;

(i) Medical service, factory doctors having been appointed to one hour a week at each mill.

The senior medical inspector's report compares with preceding years as f as 1900 the notifications received under Section 73 of the Factory and Worksh 1901, which requires every medical practitioner to report to the Chief Inspe Factories (and the occupier to notify the Inspector of Factories and Certifying S for the district), cases of lead, phosphorus, arsenical, mercurial, carbon bisu aniline and chronic benzene poisoning, toxic jaundice, epitheliomatous and ulceration, and anthrax, contracted in a factory or workshop, as follows :

Industries	Reported Cases*											
			Average									
	1925	1924	1921-1923	1918-1920	1915-1917	1912-1914	1909-1911	1906-1908	1903-1905	1902	1901	1900
;g	326[13]	486[32]	271[26]	198[20]	349[21]	522[33]	576[35]	619[30]	601[23]	629[14]	863[34]	1058[38]
ng of metals	22	38[1]	18[3]	28[3]	44[2]	39[4]	49[4]	45[2]	31[1]	28	54[3]	34[1]
oing and ering ..	7	6	8	11[1]	21[1]	31[3]	30[1]	21[2]	24[2]	23[1]	23	9
eaking ..	31	131[1]	21	2	—	1	—	—	—	—	—	—
ig	8	6[1]	10[1]	9[1]	15[2]	27[1]	29[2]	24[2]	16[2]	19	23[1]	18[2]
g	4	3	2	2	3	11	17	18	13	11	10	5
ontact with en lead ..	17[1]	23[1]	11[1]	10[1]	24	23[1]	24[2]	24	22	24	25	30[1]
and red	19[1]	20[1]	24[1]	18	37	32[1]	47[2]	94[3]	114[2]	156[1]	203[7]	377[6]
y	47[5]	47[18]	40[13]	19[7]	21[6]	57[11]	77[7]	115[8]	99[3]	89[4]	113[5]	210[8]
us enamel-	9[2]	9	5	1	4	8	14	6	3	3[1]	9	11
ic accumu- 's	73[1]	101	54[1]	37[1]	45[1]	41	27[1]	24	29	16[1]	49[1]	33
and colours	8	15	13[1]	8	15	21	26[1]	32	43[1]	46	56	56[1]
ıbber ..	2	3	4	6	8	5	5	2	2	2	1	1
ouilding ...	23[1]	30[4]	16[1]	12[2]	31[2]	71[4]	90[6]	75[4]	60[4]	63[1]	65[4]	70[5]
ilding ..	13	8[1]	8[1]	9[1]	21[2]	32[3]	28[3]	21[1]	35[1]	15[1]	28[1]	32[3]
used in r industries	14[1]	24[2]	19[1]	11[1]	19[1]	45[2]	50[1]	44[2]	41[2]	44[1]	61	50[5]
ndustries .	29[1]	22[2]	18[1]	15[1]	42[4]	77[3]	63[3]	74[5]	70[4]	90[3]	143[12]	122[7]
oisoning ..	—	—	—	1	3	—	1	1	1[1]	1[2]	4	3
soning ..	6	6[1]	—	3	11[2]	4	7	12[1]	4	4	1	22[3]
soning ..	5	5	3	7	14	14	10	7	6	8	18	9
hide poison-	3	—	—	—	—	—	—	—	—	—	—	—
ning ..	31[1]	—	—	—	—	—	—	—	—	—	—	—
ene poison-	—	—	—	—	—	—	—	—	—	—	—	—
.. ..	2[1]	3	4[1]	14[5]	132[34]	—	—	—	—	—	—	—
us ulcera-	160[55]	123[24]	41[3]	45[1]	—	—	—	—	—	—	—	—
ulion ..	54	45	43	126	—	—	—	—	—	—	—	—
.. ..	45[9]	43[4]	39[5]	59[9]	83[12]	57[7]	57[11]	57[13]	52[13]	38[9]	39[10]	37[7]
.. ..	25[4]	19[1]	15[2]	37[6]	54[7]	33[5]	30[5]	22[5]	22[6]	12[2]	6[1]	9[2]
air ..	3[2]	4[1]	7[1]	4[1]	4[1]	6	7[1]	12[3]	9[2]	10[2]	9[1]	12[3]
ing of hides skins ..	16[3]	16[2]	15[1]	16[2]	22[3]	14[1]	17[3]	15[3]	16[3]	11[5]	20[5]	9[1]
ndustries .	1	4	1[1]	2[1]	3[1]	4	2[1]	9[3]	6[3]	5	4	7[1]

first entry for some of these diseases, such as carbon bisulphide poisoning ine poisoning, is seen to be for 1925, as it was on February 1st, 1925, that these poisoning were added to the list.

h regard to lead-poisoning, diminution in the number of cases of lead- g from shipbreaking is ascribable not to increased ability to control the cause ion into the lungs of volatilised lead, from the use of the oxy-acetylene

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he principal figures relate to cases, the raised figures to deaths. Fatal cases not reported in previous years d as both cases and deaths.

blow-pipe flame) but rather to the lighter class of vessel now being broken to the fewer numbers employed.

The following figures suggest sufficiently clearly an average life now l longer than it was 25 years ago for those who succumb ultimately from the el plumbism in the pottery industry :

Period	Number of fatal cases	Total ages	Ave
1900–04	17	697	
1905–09	25	1,109	
1910–14	38	1,753	
1915–19	27	1,284	
1920–24	56	2,863	

This is a tribute to the time, money, scientific and inventive genius sh all concerned.

Aniline poisoning.—By aniline poisoning (Germany—Anilismus, Franc lisme) is meant not only poisoning by aniline alone but also the train of sy set up by aniline compounds or intermediates, such as dinitrobenzene. In tw 31 cases, tumours of the bladder led to notification. Several of the cases the rapid way in which aniline, either as a liquid (in the form, *e.g.*, of anil splashed or spilled on to the clothes, or falling as dust (*e.g.*, in the packing c nitranilin), is absorbed by the blood directly from the skin.

Anthrax.—Figures are given bringing out the noticeable diminution th been in the fatality of anthrax, due first to greater knowledge of the appe of anthrax through an illustrated placard and, secondly, to the effects of tre by Sclavo's serum. Excision of the pustule is rarely practised in any centre i Britain where cases of anthrax are fairly common. Anthrax was cultivate of 197 samples of wool and hair collected in connection with cases of anthra possibility of a method of disinfecting hides and skins without injuring them i pursued by the British Leather Manufacturers' Research Association (under th tion of Dr. R. H. Pickard, D.Sc., F.R.S.), in conjunction with the Departm Scientific and Industrial Research.

Epitheliomatous ulceration.—During the year a committee was appoi enquire into the occurrence of epitheliomatous ulceration (skin cancer) amon spinners in the cotton industry. The total number of such cases which have c the knowledge of the Factory Department from 1876-1925 is 539. In 450 (per cent) the epithelioma was on the scrotum, and in the remaining 89 (or 1 cent) on other parts of the skin. In only 14 (2.6 per cent) was the duration of e ment less than 20 years, while the average duration of employment was approxi 40. The shortest length of time (or its development was 10 years, and the 63. In 13 cases the disease appeared from one to 14 years after the person a had retired from all employment. When neglected, death has usually occu from one to three years from the onset. Of the 539 cases, 203 (37.7 per ce known to be alive after intervals of from one to 20 years following an ope Of 35 (6.5 per cent) trace has been lost, and 301 (55.8 per cent) have died. that there are approximately 49,000 to 50,000 cotton mule spinners and piece death rate for scrotal epithelioma is about 0.5 per thousand, or 1.4 per thous those over 35 years of age.

Dermatitis.—Dermatitis is not notifiable, because confusion would nec and frequently arise between idiopathic and industrial eczema. Nevertheless

industrial dermatitis are voluntarily notified, and these numbered (apart rome and epitheliomatous ulceration) 331. A chart is shown (prepared by nan medical inspector) giving for these 331 cases : *(a)* the nature of the skin and *(b)* the trades in which they occurred. The order of the irritants, from est to the lowest was—alkalies, dyes, turpentine, oil, flour, acids, sugar, french paraffin, lime, etc. ; and of the trades in which the largest number of cases orted, the highest to the lowest—dyers, engineers, labourers, french polishers, chemical workers, metal workers, etc.

d.—A medical inquiry into the incidence of diseases of the lungs among workers was undertaken under the supervision of Dr. Middleton, the medical r, with special knowledge of silicosis, by the senior and junior members of lical Board under the Refractories Industries Silicosis Scheme, 1925. They out examinations of 568 persons, and found the number affected with fibroid considerable. Their report will be published in 1926. Much attention is id in Great Britain not only in the pottery industry but also in the grinding ie industry to the subject of silicosis, with a view to the formation of compen- chemes analogous to those under the Refractories Industries Scheme.

on-weavers' cough.—An account is given of an investigation into the occur- weavers' cough in a mill in Burnley, in which 17 men and 42 women (of a 85 men and 160 women employed) were affected to such a degree as to cause on from work. The symptoms are those of paroxysmal cough, and it is to be due to aspergillosis. While dust laden with conidia, spores, and frag- f mycelium were found in samples collected from the air in the workroom, he cotton fibre itself, the specific organism, mould, fungus or lower form of giving rise to it, has not as yet been determined.

nes and gases.—A comparative table is given of the reports on "gassing", for a number of years past the number reported. Such reports are not now unless absence from work has lasted for three days.

	1913	1914	1917	1918	1919	1920	1921	1922	1923	1924	1925
xide	59[7]	62[9]	99[18]	54[13]	85[19]	56[9]	77[14]	111[14]	134[7]	107[10]	118[10]
furnace ..	20[3]	20[5]	22[6]	17[3]	33[6]	20[5]	18[3]	28[4]	31[4]	24[1]	25[6]
r	21	21	32[8]	21[3]	19[1]	16	27[3]	37[7]	43[2]	25[4]	34[1]
.. .. ..	9[4]	7[1]	20	10[4]	10[4]	9[3]	18[4]	32[1]	35	36[2]	26[2]
r	9	14[2]	25[4]	6[3]	23[1]	11[1]	14[5]	14[2]	25[1]	22[3]	33[1]
e	12[1]	3[1]	1	5[5]	3[1]	—	5[4]	1	10[2]	5[2]	10[2]
hydrogen ..	8[1]	22[3]	11[4]	7[1]	3	13[4]	3	12[3]	8	11[4]	4
de	1	1	2	1	7	2	5	7	10	10	3[1]
. .. ..	1	2	3	4	9	8	3	11	16	20	12
.. .. ..	—	9[2]	62[5]	27[7]	5[2]	9[3]	—	8	7	10[1]	10[2]
ha	3	4[1]	4[1]	6[1]	8	—	9[1]	8[1]	5[1]	1	5
hydrogen ..	6[2]	4[2]	4[2]	7[4]	9[3]	12[4]	10	25[4]	55[3]	26	3[1]
ine	2	1[1]	12[3]	2	3	5[3]	1[1]	1	4[2]	3	2[1]
acetone, nickel etc.)	—	25[4]	—	—	—	—	—	—	—	—	—
	—	—	4	1	3	9	3	10[1]	35[2]	28[4]	35[3]

ght-lifting by women and young persons.—A chapter is devoted to an enquiry ybil G. Overton, Medical Inspector of Factories, into a variety of industries because of the likelihood of heavy weights being carried, such as tin plates,

sanitary pipes, pottery, paper, jam, cutlery, cotton and woollen. Her gene clusion is that the enquiry did not produce evidence of definite injury to he solely to weight-lifting and carrying ; and she suggests that weights should no 40 per cent of the body weight for more or less continuous lifting or carrying per cent of the body weight for occasional lifting and/or carrying.

First aid.—An account is given by Mrs. B. C. Bridge, appointed tem as inspector of factories because of special knowledge gained from administrat large general hospital, of the provision of first aid in every factory (Section 2 of the Workmen's Compensation Act, 1923). She is satisfied that real pro being made in the standard of first aid and ambulance arrangements.

INDUSTRIAL FATIGUE RESEARCH BOARD.

The Industrial Fatigue Research Board is a branch of the Medical I Council, of which the terms of reference are as follows :

> "To suggest problems for investigation, and to advise upon out schemes of research referred to them from time to time by the Research Council, undertaken to promote better knowledge of the of hours of labour and of other conditions of employment, including of work, to functions of the human body, having regard both to the vation of health among the workers and to industrial efficiency ; take steps to secure the co-operation of industries in the fullest application of the results of this research work to the needs of ind

While the Board has seven full-time investigators, the work is largely o in committees, of which the following are in active work at the present time :

(a) Scientific Committees :

1. Statistical ;
2. Physiology of muscular work ;
3. Industrial psychology.

(b) Special Committees :

1. Post office work ;
2. Accident causation ;
3. Optimum length of spell ;
4. Physiology of ventilation ;
5. Design of machinery ;
6. Industries specially affecting women ;
7. Sickness in cotton weaving.

In the report of the Secretary, Mr. D. R. Wilson, M.A., D.Sc., for 1925, an is given of the actual work in hand in regard to :

(a) Particular problems of wide industrial importance, suc

1. Hours of labour ;
2. Accident causation ;
3. Design of machinery ;
4. Physiology of ventilation ;
5. Rate of improvement in industrial occupations ;
6. Vocational guidance ;
7. Relation of school-leaving age to well-being and prof

(b) Specific problems submitted by Government departments or industrial associations, such as :

1. Sickness in cotton-weaving sheds, that is, a comparison of the relative sickness among weavers in sheds that are artificially humidified and in sheds that are not ;

2. Sickness in the printing industry ;

3. Weight carrying and lifting (under the direction of Professor E. P. Cathcart, Professor of Physiology, University of Glasgow) ;

4. Telegraphists' cramp ;

5. Vision and lighting ;

6. Atmospheric conditions in mines ;

7. Atmospheric conditions in cotton-weaving sheds ;

8. Vocational guidance ;

9. Floor surfaces ;

10. Efficiency in typewriting.

(c) Laboratory researches, such as :

1. The principles governing muscular exercise ;

2. Tests for physical fitness ;

3. Industrial work involving muscular effort.

ther, laboratory research on these lines is being made into repetitive work, skill, etc.

report is particularly valuable, because the second part, covering 100 pages, d to analysis of the work published by the Board since its formation in July

le speaking of the work of the Industrial Fatigue Research Board, reference so to be made to that of the *National Institute of Industrial Psychology*, of e President is the Earl of Balfour and the Director Dr. C. S. Myers, M.D., .R.S. The Institute has for its aim the practical application in industry nclusions arrived at by the Industrial Fatigue Research Board. It has been ated as an association for promoting science, and its whole income is applied in g its activities and not in the payment of any dividends to members. The lertaken may be ranged under the following heads :

1. Investigation of the best methods of applying human energy in factories, offices and the like ;

2. Elaboration and application of suitable tests, so as to try to secure that workers are suited for their jobs ;

3. Training courses for managers, foremen, and others ;

4. Determination and realisation of other conditions pertaining to health, comfort and well-being of the worker, and the best relations between management and labour.

Institute has a large council and advisory board, and publishes a monthly rom its office, 329, High Holborn, London, W.C.1.

MINERS' WELFARE FUND.

This fund is established under Section 20 of the Mining Industry Act, 19
is provided by a levy upon all coal-owners of one penny per ton of output
objects of the fund are defined by the Act as : " Such purposes connected w
social well-being, recreation and conditions of living of workers in or about coal
and with mining education and research, as the Board of Trade, after consu
with any Government Department concerned, may approve ".

The duty of allocating the money from time to time standing to the cr
the fund is vested in a Committee of five persons appointed by the Board of
and they are assisted by three Assessors appointed by the Ministry of Heal
Board of Education and the Scottish Office, respectively. The Committee is r
by the Act to take into consideration any scheme submitted by a district com
(consisting of representatives of the owners and management of the coal-mines
district and an equal number of representatives of workmen in or about such
and before allocating any money for a local purpose they must consult with t
trict committee (if any) concerned.

In 1925, the amount which accrued to the fund, including interest, was £1,2
of which £397,257 was allocated to recreation schemes (including erection of, or ex
connected with, institutes and halls, parks, recreation and sports grounds, p
fields, pavilions, games equipment, swimming pools and baths, colliery banc
challenge-cups for recreational or musical contests ; £181,905 for health, in
medical and nursing services of all kinds, hospitals and convalescent homes, ambu
challenge cups for ambulance competitions, pithead baths, drying rooms and s
slipper baths and washhouses ; £11,309 for education, that is, education ge
of a vocational character, or in connection with lectures in natural science, lite
travel, etc. ; and £8,701 for administrative expenses.

In the Fourth Report of the Committee, published by the Stationery Off
account is given of the numerous forms in which recreation, health, and edu
services are dealt with.

ACTIVITIES OF ALLIED ASSOCIATIONS.

The Industrial Welfare Society, 51, Palace Street, Westminster, is a privat
nisation for the advancement of welfare work in industry. It has a council com
of many well-known large employers of labour on the one hand, and on the o
trade union representatives. The Society forms and organises the welfare
arranges meetings of welfare workers at which matters relating to their wo
discussed, and trains and selects welfare workers for firms, when asked to
Its activities are recorded in its journal, which has a wide circulation and is pu
monthly.

The Welfare Workers' Institute, Leplay House, 65, Belgrave Road, V
S.W., is a private organisation of welfare workers, primarily formed to protec
interests and to establish and maintain a standard of efficiency of welfare w
It also undertakes analogous work to that of the Industrial Welfare Socie
publishes a monthly journal.

Voluntary welfare work owes its impetus and success principally to
organisations.

LEAGUE OF RED CROSS SOCIETIES (PARIS)

REPORT

PREPARED BY

THE SECRETARIAT OF THE LEAGUE

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1924-1925 :
Albania (Famine, Malaria).
Exchange of Greek and Turkish Populations.
Netherlands (Cyclone)

1926 :
Belgium, Netherlands, Hungary, Roumania (Floods)
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Red Cross Peace Programme and Foundation of the League of Red Cross So

In 1919, at the instance of Mr. Henry P. Davison, Chairman of the A Red Cross, the Red Cross Societies of the United States, France, Great Brita and Japan founded the League of Red Cross Societies. The purpose of the which now includes fifty-four national Red Cross Societies, is to maintain in peace the enthusiasm and devotion displayed during the war by the national S with the object of alleviating human suffering, and to utilise these great force realisation of a programme which is defined as follows in Article 2 of the Regulations :

" Purposes :

" 1. To encourage and promote in every country the establishm development of a duly authorised independent national Red Cross orga working in accordance with the principles laid down in the Geneva Con

" 2. To collaborate with these Societies for the purposes of the impr of health, the prevention of disease and the mitigation of suffering ;

" 3. To bring within the reach of all the peoples the benefits to be from present known facts and new contributions to science and medic ledge and their application ;

" 4. To furnish a medium which shall collaborate with the R Societies in extending, promoting and co-ordinating relief work in case of or international calamities. "

Present Programme of the League.

The League has been in existence for seven years : it devoted the first th to experiments and enquiries of all sorts, which enabled the General Counc second meeting in March 1922, to formulate a definite programme in co with the objects set forth above. On this occasion, the General Council in upon the national Red Cross Societies the importance of developing these Soc means of popular recruiting, in order that the influence of the Red Cross mig far-reaching as possible, and directed their attention to the pressing nee existed of creating among all classes an intelligent demand for better health co and an increasing knowledge of the means of securing them ; it recommended " the adoption of peace-time programmes aimed especially at meeting t through the development, with the co-operation of the League's Secretariat, of health instruction, public-health nursing and Junior Red Cross organisati latter constituting, in the judgment of the Council, a specially valuable m securing the education of the coming generation in health matters, as pa general purpose of instilling into children at the most impressionable age the service which lies at the basis of the Red Cross ideal ".

The resolutions adopted by the General Council at its third meeting, 1924, fully approved the programme of the League and recommended its ex They attached particular importance to the relief work of the Red Cross and rôle which the Secretariat of the League can exercise in regard to internation activities ". The General Council also noted in its resolutions the interesting work undertaken by the Red Cross for the improvement of health in the N Service.

Further, national Societies were requested, on the one hand, to cont extend the instruction and organisation of voluntary workers, in order to to collaborate effectively in the health and social work of the Red Cross and

ıd, to extend the means of instruction open to the public : elementary first-aid ıome nursing, personal hygiene, etc.
924, the Board of Governors approved a further extension of the League's ne in regard to the health and social aspects of emigration.

Organisation of the League.

rding to the Articles of Association, which were adopted on May 5th, 1919, ıded in 1925, and which came into force as from December 31st of that year, ol of the affairs of the League is vested in a General Assembly, a Board of s and an Executive Committee.
General Assembly, which took the place of the General Council as the supreme of the League, is to meet once every five years and is composed of delegates ng the national Red Cross Societies belonging to the League. Each national ; entitled to one vote at meetings of the General Assembly. All Red Cross organised in accordance with the principles of the Geneva Convention and ıg to the programme laid down in the Articles of Association of the League ne members of the League.
Board of Governors, which meets at least once a year, consists of a represen- each of the national Societies members of the League. The Board of Gover- ts its Chairman, who is at the same time the Chairman of the Executive ee. This Committee is composed of seven members, nominated by the Governors : it meets every three months at the seat of the League. Three ıt Committees, each consisting of three to five members, are to be appointed ɔard of Governors and will be responsible for the following duties : the , of supervising the general programme, the second, that of supervising the of special missions and the third, that of supervising financial questions.
Secretariat, at the head of which is the Director-General, consists of about ıs belonging to various nationalities. It includes the following sections : lursing, Junior Red Cross, Relief and Emigration. There is a Central Service, ordinates the work of the Secretariat and keeps in touch with the national ; it deals with questions of organisation and information and with publica- ince 1924, it has included a Pan-American Office. The Financial Service is direction of the Treasurer-General.
Secretariat, which was originally established at Geneva, was transferred to ɔeptember 1922, by decision of the General Council, in view of the practical es offered by Paris from the point of view of international action.
budget of the Secretariat is provided for out of the contributions from ross Societies. Hitherto, the major portion of the cost has been borne by ican Red Cross, which, in 1919, allocated a large sum for the constitution of ee fund designed to ensure the maintenance of the League during its early n 1922, for the first time, the other national Red Cross Societies were requested ɔute towards the budget of the League. During the financial year 1922-23, ɔf these Societies voted contributions. In the years following, the number es which contributed to the budget varied from thirty to forty. The budget 26 was fixed at $135,000 for General Expenditure and at $190,000 for Special . The accounts, which are audited and certified correct by sworn auditors, shed every year.

Duties of the Secretariat of the League.

irst duty of the Secretariat of the League is to assist the national Red Cross in extending their organisation and promoting the recruiting of members

and to support them in the works of peace best calculated to improve health sickness and alleviate suffering in their respective countries, in accordance w national traditions and, as far as possible, by co-operation with Government tions and private organisations.

The efforts of the different national Red Cross Societies to co-ordinate th activities in their respective countries in the matter of hygiene and social a have naturally led the Secretariat of the League to co-ordinate such efforts national lines. With this object, the Secretariat has kept in constant tou the Office international d'hygiène publique in Paris, the Health Organisatio League of Nations, the Industrial Hygiene Section of the International Labou the Pan-American Sanitary Commission and the Rockefeller Foundatio President of the International Council of Nurses is also President of the Nursing Advisory Board. The Secretariat of the International Union agains culosis is established at the headquarters of the League.

Contact has been established with other international unions, such as th national Union against Venereal Diseases, the International Union of Tou International Eugenics Union, the International Bureau against Alcoholis Secretariat keeps in frequent touch with the International Association for motion of Child Welfare, the International Union of "Save the Children" Fu

The Secretariat of the League has been requested to nominate a delegat Advisory Commission for the Protection and Welfare of Children and Youn of the League of Nations : it will thus be able to represent the interests of the Societies on that Commission.

The Secretariat of the League and the Offices of the International Red Geneva keep in constant touch with one another, thus ensuring the necessa boration between these two bodies.

The Secretariat keeps in touch with the national Red Cross Societies b of correspondence, visits of members of the Secretariat to these Societies, a of delegates of the latter to the Secretariat of the League.

In addition to the meetings of the General Assembly which are held ev years, the Secretariat organises conferences of representatives of national S which, for geographical, economic and social reasons, are faced with proble similar character. These meetings provide an opportunity for discussion a facilitate the solution of these problems by means of joint action.

The First Oriental Red Cross Conference, which was held at Bangkok in N 1922, included representatives of seven Red Cross Societies ; nine Societies of European countries sent delegates to the Warsaw Conference in April 1923 November 1923, fifteen Societies of the American Continent were repres Buenos Ayres.

A second conference of Eastern and Central European Red Cross Societie Vienna in May 1925. In June 1926, the Second Conference of American S was held at Washington, and arrangements were made for the holding of a meeting of Far Eastern Red Cross Societies in November at Tokio.

These conferences serve, as it were, to supplement the meetings of the Assembly. In South America, more particularly, they have had a remarkab in promoting Red Cross activities in the countries represented.

The last Washington Conference has just confirmed this anew in a admitting of no dispute. The important part played in the work of the Co by representatives of Latin-American Societies and the social significance recommendations passed—among which should be noted more particularly relating to child welfare, pre-matrimonial medical examination, the prote

he teaching of hygiene in schools, propaganda for popular instruction in -bear witness to the progress realised by the American Societies since the at Buenos Ayres.

Secretariat publishes in English, French and Spanish a monthly review, culation of about 15,000 copies, entitled *The World's Health*. It forwards to nal Red Cross Societies and to persons interested in the question a fortnightly on Bulletin containing notes on its activities and those of the Red Cross and studies on special subjects based upon the experience acquired by the s in different countries. With the Bulletin are distributed every month one rticles dealing with health subjects or other questions included in the Red gramme ; these articles are intended for reproduction by Red Cross Societies wn publications or in the Press. Articles written for young people are also y month to the editors of the Junior Red Cross reviews.

League also contributes to the support of a scientific organ entitled *Matériaux ude des calamités*, which is published by the Geneva Geographical Society joint auspices of the League and the International Red Cross Committee. ct of this review, which was founded in 1924, is to stimulate research by circles into the causes of catastrophes and the study of preventive methods.

Secretariat prepares and distributes special pamphlets at the request of the members of the League or on special occasions. The Secretariat also pre- the request of the national Societies, documentary studies concerning the ion of certain special forms of activity.

rary containing the most important works relating to Red Cross questions, alth and allied subjects has been established at the headquarters of the A permanent exhibition of Red Cross material has been organised for the itors. In compliance with the desire expressed by various Red Cross Societies, tariat has also established travelling exhibitions for health propaganda n be lent to member Societies.

egards correspondence, the Secretariat despatches about 12,000 letters and bout the same number every year.

Some of the Results obtained by the League.

League has taken a direct part in the organisation of national Red Cross in twenty-five countries in which no recognised independent society pre- xisted. The number of members belonging to the existing societies has and the Secretariat is called upon to assist nearly all the Societies members ague in drawing up and extending their peace programmes. Nearly all the Red Cross Societies have now undertaken activities on a large scale in the public health. In the majority of cases, this action is definitely educational ter, the object being to lead the masses to realise the meaning and necessity e and to teach them to avail themselves of the hygienic equipment now at osal and to demand continual improvements in that equipment.

RELIEF DIVISION.

ough the real purpose of the Relief Division of the League is to afford the sistance rendered necessary by the immediate consequences of natural cata- the very nature of a calamity often makes it essential to organise without gienic measures to meet the dangers of epidemics and infection arising e disaster ; it has frequently happened, therefore, that there has been close

collaboration between the Relief Division and the Health Division of the S of the League on the occasion of calamities calling for international co-oper is this special feature of the relief work—the health work—that is calcula particularly to make this report of interest to the Health Organisation of th of Nations, with which the Secretariat of the League has, moreover, freque called upon to collaborate.

1919.

Activities in Central Europe.

The birth of these activities exactly coincides, one might say, with the ment of the League of Red Cross Societies. The League was founded on 1919, a few days after the institution of a thorough investigation, from the point of view, into the general European situation, and more particularly conditions in Esthonia, Lithuania, Poland, Czechoslovakia, the Kingdom of t Croats and Slovenes, Roumania and Russia. It was realised that the Leag had just been founded, could not remain inactive in view of the critical which was then becoming acute, and it was then that the negotiations with the Economic Council were begun, as the result of which the League was requ the Supreme Council to undertake a campaign with a view to combating th of epidemics in Eastern and Central Europe.

The Secretariat of the League, in agreement with the Supreme Economic issued an appeal to the Red Cross Societies, which responded with the utmos sity. The British Government, through the intermediary of the Imperial W Fund, forwarded a sum of £120,000 to the League, requesting the latter to c relief.

The funds placed at the disposal of the League enabled it, while render tance to Poland, to undertake similar action in Czechoslovakia, although t limited extent.

1920.

In March 1920, Mr. Balfour, President of the Council of the League of addressed to the League of Red Cross Societies a letter describing the ravage by the destitution and epidemics in Central and Eastern Europe. He requ League to organise relief action on a scale worthy of its unique position, object of coping with a calamity which, following closely upon the war, seeme more terrible than the war itself.

In reply to this appeal, the League took the necessary measures to the work of assistance which it had already begun. The efficacious action si ously undertaken by the League of Nations is a matter of common knowled

Poland.

A Research Commission was attached to the Relief Commission which l sent to Warsaw in January 1920. This Research Commission, which wa under the direction of two eminent bacteriologists, made a successful stud etiology of typhus fever. The League of Red Cross Societies assumed respo for the transport of gifts in kind and of sanitary material ; it distributed in goods in cash and kind to the value of approximately £130,000 sterling.

Czechoslovakia.

The Special Commission, pursuing its work of investigation, contributed the extension of the quarantine system and the adoption of special measures ca

the epidemic of typhus which was raging in the country. A course of instruc-ing about a month was given at Prague in order to train heads of missions ed by the Czechoslovak Red Cross to conduct the campaign against the epidemic.

ia.

ilar action was undertaken in Roumania by a mission of the League, by means which the Roumanian Red Cross had collected through its London Committee placed at the disposal of the League ; the latter offered its collaboration to ıce Mircea Society in establishing dispensaries for assisting in the cam-gainst the diseases of children.

ı of the Serbs, Croats and Slovenes.

December 1920, a health enquiry was held in the Kingdom of the Serbs, Croats enes, which enabled the Serb-Croat-Slovene Minister of Health to put into comprehensive programme and to utilise, for the purposes of the sanitary tion of the Kingdom, the co-operation of the Red Cross and other private ons.

esponse to an appeal addressed to them by the League, a number of national , and more particularly the British Red Cross, placed at the disposal of the special funds which enabled it to undertake work for the relief of starving in Vienna.

1921.

r Russia.

rmation concerning the situation in Russia had been collected by the Secre-the League, in addition to information referring directly to the question refugees in all European countries, protection of the frontiers of Eastern n States, etc.). Just when the situation revealed itself as really critical, the tatives of the League took part in convening the Conference which was August 15th and 16th, 1921, at Geneva, to consider the question of relief for The proceedings resulted in the creation of an International Relief Committee, on transferred its powers to Dr. Nansen as Commissioner. The Conference d the Joint Committee of the International Red Cross Committee and the of Red Cross Societies to supply any information which might facilitate the relief in Russia.

1922-1923.

arthquake).

Joint Committee offered its assistance to Italy on the occasion of the earth-Sicily, but the Italian Red Cross was able, owing to its organisation, to h the situation without external help.

rthquake).

he news of the earthquake which devastated part of Chile at the end of 1922, tariat of the League applied to the Joint Committee, and the latter instructed tralise the considerable sums offered by other Societies to the Chilian Red a result of this appeal, the Red Cross Societies of the Argentine, Canada,

Colombia, Costa Rica, Cuba, Spain, the United States, Poland, the Kingdo
Serbs, Croats and Slovenes, and Czechoslovakia sent direct to the Chilian R
contributions which they had collected.

Persia (Earthquake).

The Joint Committee of the International Red Cross Committee and of th
of Red Cross Societies also intervened in order to assist the victims of the ea
which occurred in Persia in the district of Turbat, Haydari.

Japan (Earthquake).

As soon as news was received of the terrible catastrophe which devastate
the Secretariat of the League got into direct touch with the Japanese Red C
called a meeting of the Joint Committee with a view to ensuring the effective
nation of the efforts of the various national Societies, preventing the multi
of intermediate organs and leaving the direction and control of the work of a
to the Red Cross Society of the stricken country, in agreement with the sister
which might come to its assistance. The Japanese Red Cross adopted this
and received and transmitted the assistance offered by other national Soci

Germany.

The economic situation in Germany having led to acute food difficulties
country in 1923, the Joint Committee of the International Red Cross Co
and the League of Red Cross Societies twice addressed to the national Soc
appeal for assistance for the suffering inhabitants and obtained from those
considerable assistance for the German Red Cross.

1924-1925.

Albania (Famine, Malaria).

In March 1924, the Council of the League of Nations, acting upon Lord P
report, voted a sum of 10,000 francs for assistance to Albania, which was the
throes of famine and malaria ; it instructed the Joint Committee of the Inter
Red Cross Committee and the League of Red Cross Societies to appoint a r
tative responsible for the administration, on behalf of the League of Nation
sums destined for relief work. The Joint Committee selected Professor E.
Professor in the Faculty of Medicine at Geneva, who saw to the expenditur
funds on the spot. On March 3rd, 1924, the Joint Committee had issued a
to eleven national Red Cross Societies, requesting them to assist the Alban
Cross in its heavy task.

Exchange of Greek and Turkish Populations.

On the occasion of the exchange of Greek and Turkish populations as p
in the Treaty of Lausanne, the League was requested by the League of Na
assist the Commission for the Exchange of Populations in taking the necessa
sures to prevent the spread of epidemics. The League therefore sent a
expert (see account of the Health Division) to whom the Relief Division, wh
interested in the question by reason of the destitution of the refugees, att
special delegate ; the latter placed himself at the disposal of the Commissio
Exchange of Populations in the matter of the organisation of camps, the dist
of food and clothing, the establishment of kitchens for the people, etc.

ıds (Cyclone).

:he occasion of an exceptionally violent cyclone which devastated the eastern s of the Netherlands on August 10th, 1925, the League of Red Cross Societies, ing instituted an enquiry on the spot, joined with the International Red Cross ee in issuing an appeal, through the Joint Committee, to certain Red Cross particularly fitted to assist the sufferers in the Netherlands. The gifts were handed over to the Red Cross Society of the Netherlands, which k their distribution.

1926.

Netherlands, *Hungary*, *Roumania* (Floods).

anuary 1926, disastrous floods resulted in the submerging of vast territories ım and the Netherlands. The League of Red Cross Societies immediately self at the disposal of the Red Cross Societies of both these countries, with the obtaining international assistance, which was amply justified by the seriousness catastrophe, and handed over to them the funds forwarded to it for this After having instituted a general enquiry into the situation, it co-operated Societies concerned, for the purpose of unifying the sanitary measures and of re-construction adopted by the two countries in question in order to he epidemics which usually manifest themselves after floods. Posters couched :al terms in French, Flemish and Dutch, and bearing the Red Cross emblem, nded the population to adopt a series of simple measures of disinfection and

ous floods having, at the same time, caused damage in Hungary and Roumania, ue of Red Cross Societies forwarded to the national Red Cross Societies of the League special reports showing the gravity of the situation and handed ıe Red Cross Societies of the two stricken countries the funds forwarded to it ster Societies.

(Refugees).

problem of refugees in Bulgaria having for more than a year assumed a rly serious character, the Executive Committee of the League, on the request ılgarian Red Cross, instructed the Secretariat of the League to study on the t immediate means could be taken to relieve the destitute refugees. On the n of the enquiry, conducted by one of the members of the Secretariat, a report was addressed to the national Red Cross Societies, setting forth a suggestions designed to enable them to choose between various means of e of a temporary character ; the organisation of the missions decided upon roceeding, and the League has got into touch with the International Red nmittee with a view to joint action.

ınal Relief Union (Ciraolo Scheme).

having received the official sanction of the League of Nations in 1922 and regards the humanitarian principles upon which it is based, the scheme put by Senator Ciraolo for the creation of a Federation of States for relief to vertaken by disaster entered upon a decisive phase, as the result of the gs of the Sixth Assembly, which decided to submit the scheme to the Governdefinitive approval.

he very outset, the Secretariat of the League, through its Relief Division, ces with the International Red Cross Committee in carrying on international

propaganda in favour of the scheme, and undertook to prepare, in collaborat the national Societies, the preliminary organisation for the realisation of the Union. The Secretariat encouraged the creation within the Societies of relief section for the study of questions relating to international relief. Th tionally important part assigned to the Red Cross in the future working of t national Relief Union bears witness to the importance attached by the L Nations to the activities of the Red Cross Societies throughout the world in th of relief. The League realised at an early date the value of such action, proved the interest which it takes in it by the creation of special services in i tariat. The Union of States for the purposes of relief will find in the Unio Cross Societies a power which is already organised and fitted for the attain the objects which both organisations have in view.

HEALTH DIVISION.

I. Popular Health Instruction.

As regards popular health instruction, the Division received from the Council of the League in 1922 the following directions :

"1. Within the limits of its capacity, to assist, with advice and Red Cross Societies in the organisation of popular health instruction a whenever called upon, deputing personnel to their service for this purpo desired.

"2. To continue the collection and study of health educational and the preparation of such material to meet special requirements.

"3. Where conditions are suitable, to stimulate the organisation, connection with Red Cross Societies, of mobile health propaganda units

In 1921, the Health Division had begun to collect a stock of propaganda which it was subsequently obliged rapidly to increase in response to the many received from all quarters.

The Division collects not only the propaganda material published by Cross Societies but also any similar material derived from other sources, object of obtaining examples, models and fresh ideas. This material is comm by way of example, for propaganda purposes, to the national Societies which improve their activities in this direction. As a rule, therefore, the Division undertake to distribute large quantities, but simply sends specimens. standing, the report submitted to the General Council in April 1924 show 7,500 pamphlets and 800 posters had been distributed, whereas the report draw the occasion of the General Council in 1922 mentioned only approximat pamphlets and 150 posters. For the year 1925, the figures were 34,000 a respectively.

Further, in certain special cases, the Division itself publishes leaflets an pamphlets[1]. Such work, however, is of an exceptional character, as the pecu of each country must be taken into account and the majority of the model pa

[1] In 1924, for example, 26,875 copies of an illustrated pamphlet entitled *Principles of Hygiene*, tra nine languages, were distributed. In 1925, the Health Division undertook the drawing-up and illust pamphlet on *Hygiene in the Merchant Service*; this pamphlet will be published during the course of the ye

e modified according to their destination. The documents which are collected arded, therefore, serve mainly to prevent the national Societies from engaging essary experiments in the production of material for health propaganda. sion is always prepared to co-operate in the editing and preparation of such with the national Red Cross experts, who can alone supply the data necessary rfect adaptation of the material to a particular country.

ns.

tion should be made, lastly, of an other branch of propaganda. This is the tion of the Secretariat of the League in health exhibitions, a form of activity is first undertaken at the Strasburg Health Exhibition, where the League's re rewarded by a Grand Prix. The Secretariat had exhibited a considerable of material, consisting more particularly of models, graphs, posters and s, all relating to the aims of the League and to the results already obtained rious countries of the world.

925, the Secretariat took part in the Health Exhibition held at Vienna from uly 1925, its chief work being the co-ordination in a Red Cross stand of the sent by the national Red Cross Societies. In 1926, it took part in the Dussel- Budapest Health Exhibitions.

also preparing to take part in the Philadelphia Exhibition.

n the case of the distribution of printed matter, there has been a steady n the loan of health propaganda films since the beginning of this form of These films are bought in every country where it is known that they are nd. It is chiefly from France, England and the United States that this is drawn. The judicious selection of films sometimes involves great diffi- There are films that have to be adapted, cut or revised, and the Division is developing the means of co-operation with other groups for the production lms. The present collection consists of about 150 films dealing with child nursing, tuberculosis, venereal diseases, epidemics, personal hygiene, pre- nedicine, the Junior Red Cross, harmful insects and animals, alcoholism, lances and general documentation on various Red Cross activities.

e films are placed at the service of the national Red Cross Societies for an eriod of three months. Experience has proved that the attraction of films sible to a large extent for the success of health lectures.

n 1922 to 1924, these films were circulated in twenty-nine different countries ; he films, however, are kept as specimens in the offices of the Secretariat of ie, where they can be shown to visitors.

Division also keeps in touch with the technique of the cinema world, and knowledge at the service of the national Societies that need aid in acquiring the material. The films lent by the League are circulated as examples of da work. The Health Division has also taken upon itself the task of buying rding to Red Cross Societies any films of which they could make permanent centralising its orders, the Secretariat of the League can often obtain favour- hase terms.

her, in accordance with the decision passed by the Conference of Red Cross at Warsaw in 1923, the Secretariat has acquired a transportable cinema s as a model type to be used by mobile health units for propaganda purposes ntensive health demonstrations.

Mobile Health Units and Intensive Health Demonstrations.

The Health Division has assisted directly in the organisation of mobil ganda units consisting of a portable cinema apparatus which can be moun motor lorry or transported on a special railway coach and can travel to all p country so as to reach as large a part of the population as possible. The part of the Secretariat of the League in these demonstrations becomes less and less i sable as the national Societies to whom this assistance was formerly supplied and are able to assume for themselves the responsibility and expense inc this service.

Information concerning this intensive and particularly effective means c ganda is at the disposal of members of the League.

The Division has also made a study of several projects for intensive health strations, with the co-operation of various Red Cross Societies, and has taken several of these demonstrations.

The principle, as applied, for instance, in Jumet (Belgium), consists i on and forming into groups, in a given locality and under the auspices of the R all the resources of preventive and social medicine tending to improve publi and thus to decrease large losses in human life from avoidable disease w constantly occurring under the almost indifferent eyes of the public ; it is e state here that, as a result of these concerted efforts, infant mortality in regions has been reduced by one-half, to say nothing of the less immediate

If, at the end of some years, those interested are of opinion that these should be permanently assured to the community, it will be done by means of port of the public authorities, and the Red Cross will be free to turn from this stration work to other places or other tasks.

II. Documentation and Enquiry Division.

The propaganda material referred to above is prepared in advance acco needs which are foreseen. It also frequently happens that the national Soci on the Secretariat of the League for technical information relating to their prog or organisation.

It is therefore necessary that the Health Division should keep its fund mation completely up to date ; in this, the Division is helped largely by the ric of journals and books contained in the continually increasing library of the Sec This classified material serves as a source for replies to certain enquiries, or editing of articles and studies that may be sent directly to the national or be printed in the periodical publications of the League.

This information is supplemented by correspondence and co-operati specialised organisations, bureaux and international offices of tuberculosi welfare, venereal diseases, eugenics, mental hygiene, town-planning and alc or with international associations still in their beginning, such as the Te Committee of the future International Union against Cancer. In this w Division forges an intellectual link of co-operation between the Red Cross and numerous international institutions.

In the cases in which the League has developed particularly close co-o with the institutions, a more detailed description is necessary.

III. Participation in the International Health Movement.

he last General Council meeting of the League in 1924, the national Red Cross themselves defined their rôle in relation to the social scourges as follows :

" The General Council, whilst recommending that the national Societies inue, and, if necessary, institute collaboration with the national Associations h specialise in campaigns against social scourges, expresses the desire that Secretariat of the League pursue and intensify its collaboration with the ɛtariats of the International Unions against Tuberculosis, Venereal Diseases, Cancer and that it co-operate to bring about the centralisation of the efforts hild Welfare.

" The General Council also recommends that the Secretariat of the League v the possibility of the establishment of closer individual relations between ɛ organisations. "

(Resolution XXXVII of the Third Meeting of the General Council, April .)

culosis.

rtue of this resolution, the Secretariat of the League has instituted close co- with the Secretariat of the International Union against Tuberculosis. By greement, the latter has its headquarters at the offices of the League and ɛcordance with the instructions of the Executive Committee and the Secre- he Union. The Secretariat of the International Union against Tuberculosis a Bulletin with accounts of important new scientific and social information ; it atistics, maintains a documentation service and collects comparative data on ɪ. Thus, owing to the maintenance of this close contact between the two ns, the Secretariat of the League is in a position to furnish to national Societies ɪte account of the currents of opinion and progress in various countries. national contact stimulates a healthy spirit of emulation and helps to form ɑ facts the accuracy of which is recognised by experts throughout the world.

Welfare.

" The General Council expresses its special interest in all activities for the ction and preservation of child life, and recommends that all the activities ɛtaken by the Red Cross be organised in methodical fashion with the help of a ɛal Board within the Red Cross organisation, laying special emphasis on the ction of children threatened by disease. "

Resolution XXXIV of the Third Meeting of the General Council.)

e past, the Secretariat of the League assisted certain of the national Societies velopment of specialised activities for the protection of childhood ; it has ɪlated the formation of such activities by furnishing information and sugges- ɪrthermore, as in the case of tuberculosis, the Secretariat has joined in the establish intellectual co-operation for child welfare. The League was a f the International Association for the Promotion of Child Welfare. Since Section of the League of Nations has taken over the work of this association, ɛariat of the League is represented by a member of the Health Division on ory Committee for Child Welfare, which meets periodically, at the instance ɪgue of Nations. The Secretariat is therefore in a position to participate in ational movement in this field, to represent the national Red Cross Societies,

and to keep them informed of the progress made in national and internatio welfare.

(c) *Venereal Diseases.*

A Venereal Diseases Division, which has been established within the Se of the League has collected copious documentation and has assisted in throughout the world a knowledge of the methods to be employed in propagan such as lectures, leaflets, posters and films. In response to numerous requ Division has re-edited in 1926, one of these leaflets which rapidly became Mention might also be made of the important effort for international co-or made by the Secretariat of the League of Red Cross Societies in calling in ion three regional conferences, in Copenhagen (June 20th-25th, 1921), in (December 5th-10th, 1921), and in Paris (December 14th-17th, 1921). The Conferences dealt with numerous questions concerning social measures and le already in existence. They also presented the main lines along which t venereal campaign had been conducted in Europe, and demonstrated the international co-ordination. With this object in mind, the Venereal Division of the League has been collaborating during the past few years International Union against Venereal Diseases.

This union, which now pursues its activities independently, decided, hov its last assembly to institute a permanent organ of liaison with the League.

(d) *Miscellaneous Aims.*

The work of the Health Section is essentially capable of expansion, activities in the matter of collecting documentary information and of ensuri national liaison can be developed according to need in any way likely to be to one or more national Societies. The communications which members Division may undertake to make to the various congresses or meetings, as work which may be entrusted to them in various countries, are so many forms of international co-operation in health matters between Red Cross S

This co-operation may be exemplified by the efforts of the Secretariat to the Norwegian Red Cross in its endeavours to improve health conditions in t cantile marine.

It will be remembered that, at its meeting in Paris, in May 1924, the Council of the League unanimously approved the Norwegian proposal urg national Red Cross Societies of all maritime ports to help, so far as pos improving health conditions, more especially by the following means: (1) Edu propaganda on board ships, by posters, pamphlets and other means: improvement of existing manuals on hygiene for seamen or the publication ones; (3) The establishment, in large numbers, of general dispensaries in all for the treatment and prevention of disease; (4) The preparation of des up-to-date and international types of medicine chests.

The Norwegian Red Cross, which has already organised dispensaries exclusive treatment of seamen in twenty of its seaports, was requested, joint the Secretariat of the League, to investigate the possibility of carrying throu programme by setting up effective liaison, in all parts of the world, between Cross Societies and between the voluntary and government associations or working for an improvement in health conditions among seamen. The Healt sion studied this question and has endeavoured, with the assistance of the Publ Division, to disseminate among the various national Societies all the info

both by the Norwegian Red Cross and by the Secretariat. By taking charge ernational side of this question, the latter gave all the assistance in its the travelling Conference which the Norwegian Red Cross has just convened nd which will hold meetings in the principal Norwegian seaports.

e is every reason to hope that this Conference will enable all the Red Cross concerned, and all associations pursuing the same ends, to institute, in t with the maritime authorities of each country, a scheme for the international tion of all efforts directed towards the improvement of health conditions erchant service. For it is of the highest importance that seamen should re be able to obtain the best treatment and advice that preventive medicine 'er ; and that they should be assured of treatment on uniform lines in all pending the ratification of such conventions as may subsequently be adopted nternational Labour Conference. In this connection, it may be recalled, rly as 1924 the League of Red Cross Societies and the Norwegian Red Cross, f securing for the Norwegian proposals the support of international legislation nternational agreement, laid the Norwegian scheme before the Joint Maritime on of the International Labour Office, requesting that body to recommend leration, by the International Labour Conference, of a detailed scheme for vement of health conditions in the mercantile marine.

ction has yet been taken on this request, as the Joint Maritime Commission he Norwegian scheme to a sub-committee which has not yet submitted its n the matter.

ATIONS WITH OFFICIAL ORGANISATIONS DEALING WITH INTERNATIONAL HEALTH QUESTIONS.

rganisation of the League of Nations, Office international d'hygiène publique, International Labour Office.)

ave attempted to indicate the efforts made by the Secretariat of the League nate and support free and spontaneous movements on behalf of hygiene. ese efforts fit into official and Governmental action ? The general scheme trace : just as the respective Societies are in communication with their own nts, so the Secretariat has been entrusted with the task of bringing to the of international agencies the meaning of the Red Cross, as the following indicates :

'The General Council approves the policy of the League in maintaining contact with the League of Nations, the International Labour Office, and Office international d'hygiène publique, and those international unions are working for the improvement of health, as well as stimulating the tion of such unions, when necessary, in these special fields where inter- nal groups have not previously been formed. "

with the Health Organisation of the League of Nations.

e time of the creation of a provisional Health Committee in the League of member of the Secretariat of the League was appointed to this Committee. became permanent, and was organised on a new basis

ler to represent the Red Cross as a whole on this Committee, it was agreed Joint Committee should appoint the representative. At the particular

recommendation of the League of Red Cross Societies, Professor Cantacu proposed to the Health Committee, which endorsed the proposal and recor that the Council of the League of Nations should approve his appointment.

The necessity for co-operation with the Health Organisation of the L Nations can be understood on consideration of the auxiliary activities of Cross in the past and the ever-present possibility that similar action will ha taken again. An instance worth noting in this connection is the gift made in by the League of great quantities of material, clothing, etc., to the Epidemic sion of the League of Nations, which distributed them in Warsaw during the c against typhus. This same period saw also the appointment of a special Co by the League of Red Cross Societies to study typhus and to assist in the figh this disease.

Following the European Sanitary Conference in Warsaw in 1923-24, th contributed £5,000 toward the organisation of a course of instruction des raise the standard of training as well as to increase the personnel who were imm to be sent to Poland and Russia on anti-epidemic work.

The general lines of management of the funds placed at the disposal of th Section of the League of Nations were determined by a Commission compos Medical Director of the Health Section (Secretariat of the League of Natio two members of the Secretariat of the League of Red Cross Societies. The e of the programme devolved on the Health Section of the League of Secretariat.

Another typical example is furnished by the mission sent by the Leagu Cross Societies, at the instance of the Mixed Commission for the Exchange and Turkish Populations, with a view to obtaining an opinion on the sanitary c of the exchanged populations, at a time when the rapid spread of infectiou was feared.

The report of this mission, transmitted to the Council of the League of was discussed by the Permanent Health Committee, where the presence of sentative from the Red Cross proved of the utmost value. After the report l examined, steps were taken by the Council of the League of Nations to imp sanitary conditions of the unfortunate populations concerned.

Relations with the International Labour Office.

After the Director-General and the Secretary-General of the League had p their report to the Third International Labour Conference in November 1 International Labour Office asked the League to deal with the special pro popular health instruction among the working classes. This plan was worke Jumet, for example, by the combined action of the Belgian Red Cross and the With the help of the mutual insurance societies of this city, special efforts were toward this type of propaganda, and the attention of all the national Socie drawn to this matter.

A point of detail should be further mentioned in connection with the grea made by the International Labour Office to create a centralised system of d tation on injuries and prosthetic apparatus. Being informed of this undertak having granted a subsidy for the purpose, the League was in a position to number of specimens of the work, which were distributed among the national S These have a permanent value as perfected examples of the application of stu discoveries brought about by war conditions, and are in addition undoubted in increasing the earning capacity of invalids in peace time.

recently, the League had occasion to submit to the International Labour
: question incorporated in the programme of the General Council of 1924 by
egian Red Cross concerning health in the merchant marine. The keen
hown in this problem by the International Labour Office is a much appre-
couragement to continue the work of propaganda and popular instruction
n by the Health Division. Collaboration in other ways is still being studied.

NURSING DIVISION.

centres for the professional and technical training of nurses are of recent
d their development has been the outcome of a general public need. The
ivision of the League acts as an advisory body to national Red Cross Societies
tters relating to nursing. These societies have requested it to undertake
paganda in countries where the nursing services are not as yet developed,
age the establishment of training schools for nurses, and to train, for these
suitable personnel qualified to inaugurate and direct movements for the
ent of training schools for nurses and the institution of public-health nursing
In order that the Nursing Division might benefit by the wisdom and expe-
caders in the nursing field in various countries, a Nursing Advisory Board
ituted in 1924. This board consists of seven members, elected from among
nent members of the nursing profession in various countries, and holding
a period of five years. It meets once a year to consider and discuss the
of the Nursing Division.

International Courses in Public-Health Nursing.

countries there is a growing need for fully trained public-health nurses,
inistrators and teachers of schools of nursing. With this primary purpose
d as a result of the general need for a centre of nursing education in Europe,
ses can receive post-graduate instruction, two international courses have
olished in London by the League in co-operation with the Bedford College
n and the nursing, health, and social aid authorities concerned. The work
tre may be divided into two departments : *(a)* An international course in
lth nursing, instituted in 1920 ; *(b)* An international course for nurse
tors and teachers in schools of nursing, instituted in 1924.
Red Cross Societies, Governments and various institutions offer scholarships
wishing to follow one or other of these courses ; the League of Red Cross
as, moreover, appropriated a sum in its budget for the purpose of offering
ps to such national Societies as apply for them.
nternational course in public-health nursing includes instruction, lectures,
practical work, and visits to various health institutions and services.
ork is arranged to suit individual needs, but a general idea can be gained
ollowing syllabus :

Theoretical Instruction.

e and Public Health (50 hours).

ersonal hygiene : Of body and mind, based on standards of physiological
health and capacity. Care of eyesight, hearing, teeth, etc.
revention of communicable disease : Micro-organism in relation to disease.
Modes of attack. Resistance of body. Disinfection, etc.

(c) Community hygiene : Water supply. Sewerage. Milk supply. Sanitation, etc.

(d) School hygiene : Physical conditions affecting health. Indicatio health and defects. Effects of fatigue, employment, etc. R Care of defective, retarded, abnormal children. Schoolro tation.

2. *Nutrition* (10 hours).

Food values. Classification. Principles of diet and dieting. Diet and feeding of school children.

3. *Tuberculosis.*

The work of a tuberculosis dispensary.

4. *Infant Welfare Work* (25 hours).

(a) Definition of an infant welfare centre. Aims. Limitations. Im of right atmosphere. General outlines of the work, etc.

(b) Hygiene of the management of the infant. Temperature of rooms lation. Air space. Training of the infant. Importance of r of hours and details.

(c) Feeding and clothing. Bedclothes. Cots. Infancy to one year.

(d) The toddler.

(e) Premature babies. " Difficult " babies. Malnutrition. Rickets.

(f) Organisation of an infant welfare centre.

5. *Principles of Education and Practice of Teaching* (16 hours).

(a) These lectures apply the principles of psychology to the science of They include the problem of attention and the means by which can be maintained. The use of imagination in descriptive p lesson and in its illustrations. Economical methods of learning factors on which memory depends. Some advantages and lir of routine activities. The teacher's personality and the use of su and sympathy. Methods of preparing notes for lectures and The testing of knowledge by examination.

(b) The application of these principles to the teaching of health e (4 hours).

6. *Psychology.*

(a) General (30 hours).

Mental life studied from the genetic standpoint :

1. Native endowment ;
2. Mental development.

(b) The psychology of infancy and adolescence (20 hours).

These lectures are mainly concerned with the facts of mental gro ing the two most important periods of development, infancy and ado They include a detailed account of the life of the child during three years, showing the normal development of interests and and the importance of early influences in the formation of charact

ıdolescent period is viewed particularly in regard to the social problems to vhich it gives rise ; the psychological causes of hooliganism, juvenile delinjuency, and various forms of individual mal-adjustment are discussed.

Demonstrations of tests of intelligence and tests for vocational guidance ınd selection are given in connection with the lectures.

parative Study of Some Modern Industrial Problems (20 hours).

Development of industry and its present organisation. Health and efficiency ected by industrial conditions.

Welfare work. Unemployment and its effects and possible remedies. Women's problems. Schemes for endowment of motherhood. Family wages and widows' pensions.

The standard of life in different countries. International Labour legislation. The meaning of economic wealth. The theory of value. International trade and foreign exchanges. Wages. Rent. Interest and profits.

Theory and Administration (60 hours).

The structure and organisation of society among primitive peoples. The growth and development of various forms of society : tribal, feudal, the city and nation state.

The development of social institutions.

Problems of citizenship in the modern democracy.

Outlines of modern social institutions. State provision for the education and protection of children. Relief of destitution.

Public-health services. Housing and town-planning. Maternity and child welfare. National health insurance.

Tuberculosis. State provision for the treatment of tuberculosis in children and adults. Linking up of anti-tuberculosis dispensaries with home of patient, schools for children, hospitals, sanatoria. Tuberculosis and environmental conditions. Work of tuberculosis nurse. Tuberculosis officer.

Mental deficiency. Provision made by the State for care of mentally defective. Voluntary associations. Consideration of after-care of defectives. Home supervision and compulsory detention of defectives in State institutions.

Prevention and relief of distress. Analysis of the chief causes of poverty—industrial, social and individual. State intervention through legislation, and voluntary effort through charitable and philanthropic movement towards social betterment. Co-operation between statutory and voluntary organisations. General principles of charitable relief. The care of the family. Social case work. Mutual registration of assistance. The work of a relief committee. The method of keeping records.

cs (9 hours).

A biological introduction to eugenics. Social application.

y of Nursing (10 hours).

This course covers the evolution of nursing from the earliest age to the nt day, including nursing in the ancient civilisations, the pre-Christian d, the influence of Christianity, the monastic, military and secular orders and oundation and growth of the modern nursing movement.

11. *Public-Health Nursing* (30 hours).

(a) History of public-health nursing.
(b) Fundamental principles of public-health nursing.
(c) Modern problems of public-health nursing in different countries.
(d) Health teaching and publicity methods employed by nurses.
(e) Records and reports. Value and method.
(f) Development. Organisation and Administration in different
of :

Visiting or district nursing ;
School nursing ;
Tuberculosis nursing ;
Rural and small-town nursing ;
Industrial nursing;
Maternity and child-welfare nursing.

(g) Methods of training and preparing nurses for public-health work.
(h) Vital statistics : use and value to public-health nurses.

Practical Work.

Practical work is arranged for each student with reference to past ex
and future work.

(a) Attendance at child-welfare centres, day nurseries and hospitals (
students to study physical conditions of infants and children,
generally in all activities of the clinic, such as weighing, filing
and home-visiting).
(b) Attendance at a tuberculosis dispensary.
(c) Experience with district-nursing associations in town and country
to obtain some insight into practical bedside nursing in the ho
(d) Experience in school-hygiene work. Physical examination of
Home-visiting. Cleansing stations. Schools for mentally an
cally defective children.
(e) About thirty excursions to places of interest in connection with hygi
public-health courses.

The curriculum for the International Course in Public-Health Nursing Ec
for Nurse Administrators and Teachers in Schools for Nursing includes all
tures given in the Public-Health Nursing Course with the exception of Infant
Work. The following subjects are given to those taking the Hospital Admini
Course :

1. *Principles of Hospital Administration* (16 hours).

These lectures are concerned with the organisation and administra
voluntary and State hospitals, including mental and infectious disease ho
Visits of observation are organised in connection with this course.

2. *Administration in Schools of Nursing* (18 hours).

This course deals with the various authorities under which training
are carried on. Hospital-training schools, private training schools, un

ls of nursing. The administration of a preliminary training school. Selec- of candidates. Ethics. Curriculum and class-room equipment. Records. rts.

Nursing Division further organises courses for nurses wishing to take up rk. Particular attention is given to the individual needs of such students, tudies and practical work are arranged to suit the requirements of each case. international courses have been attended by ninety-five, and six others have the League's certificate for special students. Among these, fifty-one are portant positions as public-health nurses, and twenty-four are directing alth nursing courses in their respective countries ; twenty-six students ng in nursing schools and hospitals ; among these, fourteen have introduced f social hygiene in the curricula of their schools ; seven are married, five are ig their studies in other countries, one has gone into a convent, and eleven g important positions in connection with social hygiene.

Nursing Division has also made arrangements to enable nine nurses, recom- y Red Cross Societies and wishing to study some particular branch of their for one or more months, to obtain facilities for practical work and for tours

Work of the Division in Various Countries.

924, the third session of the General Council of the League approved the to set up an " International House " in London for students attending the nal course. This scheme was made possible by the contributions of the Red Cross Societies, which enabled a house to be taken at 15 Manchester ld equipped as a residence for the nurses and the Director. An international ntaining books of professional interest for the use of nurses is in process ation. The " House " is open to foreign nurses staying in London. Lectures nent leaders in the field of nursing and hygiene are frequently organised

Nursing Division keeps constantly in touch with the international graduates of pamphlets, conferences, congresses, exhibitions, compilations of informa- atters of interest to nurses, and visits by delegates of the Division. In May ongress for Nurses was held in Vienna, under the auspices of the Austrian s and of the Nursing Division. It was attended by more than 350 nurses nine different countries represented. In June 1925, a Regional Congress from the three Baltic countries was organised under the auspices of the Red Cross.

Nursing Division has translated into French Mary S. Gardiner's book *The Nurse*, and has published a pamphlet on child hygiene and a large number of the work of the nursing services in various countries.

of the Serbs, Croats and Slovenes.

uly 1921, an English nurse was sent by the League to start and direct a nurses in Belgrade. The American Commission to Serbia helped to organise l and to finance five English sisters as assistants to the Directress. A Serbian e erected and equipped a school building, where a course of two years and ths was organised. A six-months course in public-health nursing is given to nurses.

xperienced Serbian nurse was sent to England for a year to study modern nethods. On her return, she took over the direction of the school, which has highly satisfactory results and trains excellent nurses.

Hungary.

The Hungarian Red Cross requested some financial help, and arran were made by the League to assist the Red Cross in reopening a nursing s Budapest, and in developing another very good school with the co-operatic University of Debreczin. The direction of these two schools was entruste Directress of the Hungarian Red Cross Nursing Service.

Colombia.

At the request of the Colombian Red Cross, the League sent a nurse to Bo a year, to assist in the organisation of a health centre.

Latvia.

The League is helping to finance a nurse acting as teacher in the Latv Cross Nursing School.

Roumania.

In 1922, the League sent three English nurses for a year to Roumania, with nursing schools working in connection with two hospitals. Two young Rou women are now taking hospital training, one in France and one in England mania is proposing to set up a model nursing school, similar to that founde Kingdom of the Serbs, Croats and Slovenes, and the League would ass Roumanian Red Cross in carrying out this scheme.

Albania.

At the request of the Albanian Red Cross, the League sent a French n Tirana to start a nursing school. It is now proposed to send three young A women to France to take the full hospital training course, after which they will to take over the direction of the school.

Belgium.

In 1923, at the request of the Belgian Red Cross, the League sent a n Belgium, who remained about a year in that country organising and dire health centre and demonstration in the industrial town of Jumet. This wo taken over and continued by Belgian public-health nurses.

The Health Work of the Junior Red Cross.

We propose to give here a brief review of the work done by the Red C promoting health among children, and would refer any reader, who may be int in the movement as a whole, to the pamphlets which it has published on th branches of its work.

The aim of the Junior Red Cross is primarily to inculcate health habits in way as to transfer these habits from the region of the conscious mind, which is question, and will not accept, imposed rules, to the region of the subconscious they become automatic and irresistible.

But, however desirous we may be of confining attention to practical exer is impossible to ignore certain theoretical aspects of health instruction. This instruction is usually part of the regular school curricula, and is hence directly the control of the Ministries of Education or other authorities. The Red Cross

, to encourage the introduction of health courses for children, wherever

h the co-operation of the school authorities of various countries, such courses is been introduced not in a rigid form, but suitably adapted in each case to requirements, notably in the United States, New Zealand. Great Britain, the Philippines, Esthonia, etc. The subjects most frequently taught are ry hygiene, first aid, home treatment, domestic hygiene, the care of infants, iene, methods of reviving the apparently drowned, etc.

er courses are intended for schoolmasters, in order to convince them of the rational instruction in hygiene. In this connection, reference may be made urses which Dr. Pirquet has organised in Austria under the auspices of the Red Cross, the Ministry of Education and the Society of Friends. These which extend over a period of ten months, are attended by schoolmasters in each province by the Minister for Education. After the final examination, f these schoolmasters are appointed travelling delegates, with the duty of ng health courses for schoolmasters and pupils in a given area. Dr. Pirquet's re subsidised by the National Children's Fund of the American Junior Red

he Kingdom of the Serbs, Croats and Slovenes, Esthonia, Latvia and Poland, ılar, the Junior Red Cross has, in many places, organised lectures for school- n hygiene and first aid, illustrated in most cases by films and lantern slides. nanner the schoolmasters are readily able to develop their knowledge and to in practice.

fact is, that, side by side with the courses exclusively devoted to health , the school curricula contain a certain number of subjects which lend them- the incidental study of hygiene questions, or enable the attention of the be drawn to such matters. In drawing lessons, for instance, pupils are set ate the principles of elementary hygiene ; poster competitions between the of the Junior Red Cross in the same country have been organised with cess. In this same connection, we may mention the admirable pamphlet l by the Belgian Red Cross.

n time to time composition lessons are devoted to the writing of plays on ıbjects, which are subsequently performed by the class or published in the ed Cross Review.

eography, the health problems inherent to the geographical position of certain are kept well in view (malaria, fevers, ankylostomiasis).

rithmetic, pupils compute the percentage increase or decrease of their weight, ntage of deaths caused by certain diseases, the advantages accruing from the on of prophylactic measures which reduce the cost of poor law relief, etc. orkshops, the pupils manufacture articles for use in the school baths and places, on the playing grounds and in the dispensaries.

we gradually approach the practical side of the action of the Junior Red this field. Its aim, in a word, is to ensure, by repeated action and by the ervance of the Rules of Health, that the child shall form good health habits, the stimulus afforded by the Junior Red Cross.

aches the child, in a simple manner, that the health of the community depends t of the individual. It appeals to its sense of fellowship and mutual aid, and to devote its strength and health to the service of others.

tly speaking, the Junior Red Cross has introduced no fresh methods into struction, but it has supplied a higher motive, an incentive to renewed efforts, existing methods to be applied with the maximum of efficiency.

First among the practical methods which it adopts, the " health game " s mentioned. This game rests mainly on emulation. It consists of a com involving a certain number of elementary health rules, which the children u to follow as faithfully as possible. Special forms bearing, on one side, the ru followed and, on the other, a number of columns corresponding to the thirty-o of the month, are distributed to the children, who indicate by a mark which ru have observed. At the end of the month the totals are ascertained, and th with the greatest number of marks are of course the winners. The health generally supplemented by a monthly weighing and measuring of the pupils. manner, children below normal weight and height are able to follow the impro obtained by applying the rules of the health game. In all countries this met been adapted to local customs and needs. The most generally adopted rules following :

1. Face, hands, neck and ears to be washed every morning.
2. Window to be kept open whilst sleeping.
3. Teeth to be cleaned morning and evening.
4. Hands to be washed before every meal.
5. A bath to be taken at least once a week.
6. Nails to be cleaned.
7. Only water or milk to be drunk.
8. The child to play in the open air every day.
9. The child to remain upright, whether sitting or standing.
10. Fingers or dirty objects not to be put in the mouth.

The method of applying the health game varies also. In most cases, fo used, on which the pupils indicate which rules have been observed. In schools in the United States, pupils are selected in turn to read the rules of th game aloud every morning. After each rule has been read, those pupils wh observed it raise their hands. The results are recorded in the " Health Bool are totalled at the end of the month, in order that the names of the winners ascertained.

The daily application of the rules of the health game thus effectively home to the mind of the child a certain number of elementary notions of h Apart from inculcating good health habits, this method has an immediate ef the cleanliness and health of the children. In its report to the Third General Co the League, the Junior Division of the Canadian Red Cross laid emphasis visible improvement in the appearance of the pupils ; hair brushed, hands a clean, teeth properly cared for, etc. In one district in the Kingdom of the Croats and Slovenes, a considerable improvement was noticeable in the he approximately 54 per cent of the children.

Like most of the work undertaken by the Junior Red Cross groups, the game is placed under the supervision of the schoolmasters. The co-opera parents is also one of the conditions of success, for it is they who can keep the re check on the observance of certain rules, such as sleeping with the window washing of hands morning and evening. We here touch upon a particularly imp matter, inasmuch as the child becomes, in turn, an excellent propaganda The parents, who in many cases belong to an ignorant and comparatively unenlig class, are gradually won over by the force of example. Thus it is, in many that some few notions of hygiene gradually penetrate into families.

The health game is only one of the numerous methods of promoting h adopted by the Junior Red Cross. We may further mention the *Health Clu*

ıg the Junior Red Cross groups. These clubs are formed by the children
es, who appoint a committee to organise the work. This committee allocates
:s, appoints its officers, and ensures the observance of the club rules. One
r instance, is responsible for a week for the inspection of hands, another for
e school-room and a third for the cleanliness of the washing places. These
officers " are relieved of their duties at the end of the week, and are replaced
pupils, so that the whole class may become familiar with these petty duties.
:em of supervision applied by the children themselves gradually produces
ıem an attitude of mind which is wholly favourable to cleanliness.
development of *open-air games*, considered as a practical means of consoli-
ıd improving the health of children, has been encouraged more or less every-
y the Junior Red Cross, which has provided, in many countries, for the
ıt of playing grounds or has lent its assistance in this connection.
American Junior Red Cross, in particular, has assisted in providing playing
in a number of European countries, and has also placed at the disposal of a
)f European Junior Red Cross Sections, a games and playing-fields expert to
'ses to teachers and to persons wishing to specialise in questions of physical
ı. Since then, this branch of work has undergone rapid development, more
r among the national Red Cross Societies of Belgium and Poland.
pen-air games we may add *gardening work*, which has led, in some countries
ıd, to the cultivation of medicinal plants by the Juniors ; this being a particu-
ıable means of acquainting children with the therapeutic properties of certain
\s for the vegetables grown in the school gardens, they are often a valuable
supply for school canteens, as also for the hospitals and orphanages which
ed by the Junior Red Cross. Although the rôle of the latter in the field of
s primarily educational, most sections subsidise, or encourage the institution
welfare schemes. This work of the Junior Red Cross is connected alike
ıealth and its civic educational activities.
:he sake of brevity we will merely mention the following among such schemes :
he holiday camps, which are organised with the assistance of nearly all the
ed Cross Sections.
he maintenance of *school dental clinics*, which are subsidised by the Juniors
he Philippines, the United States, Canada, Poland, etc.).
:hool baths and shower baths, which have been installed by the Junior Red
:ertain countries where, owing to unfavourable circumstances, the authorities
the time, unable to provide such facilities ; for instance in Austria and the
of the Serbs, Croats and Slovenes.
ispensaries, such as that of Bickse (Hungary), which have been organised
naintained by the Juniors.
preventorium has been founded by the Red Cross at Grimmenstein (Austria),
e Junior Red Cross has endowed beds for children. In this connection, we
ıtion the work of the Australian Junior Red Cross in organising homes for
ldren.
should further be noted that, in the majority of countries, the Juniors are
l in the care of *crippled children*, that they assist the *hospitals* with gifts in
in kind, and, further, that they organise *first-aid* posts which are run by
ıo have attended courses held for the purpose.

um up, wherever circumstances permit, the Junior Red Cross Committees
e with the private or public organisations working for the improvement of
giene and public health, in such a manner as to avoid overlapping and to

increase the efficiency of the individual organisations by co-ordinating th as a whole.

This action is supplemented by the issue of the Junior Red Cross *publica* questions of hygiene (pamphlets on first aid, domestic hygiene, food, etc.) an *exhibitions* organised in numerous places on the occasion of national or inter meetings and involving the display of photographs, charts, etc., and record results achieved by children in the field of hygiene.

The Junior Red Cross Section working at the Secretariat of the League co-ordinating the efforts of the various national sections, and at assisting their work, by supplying them with the information which it can procure, th its central position, and also by granting them subsidies from the special func it administers.

It issues pamphlets and posters dealing with health subjects, and publish *Information Bulletin*, appearing twice a month, all the information which re on the work of the Junior Sections throughout the world.

A games and playing-fields expert, attached to the Secretariat of the has been lent to several Junior Sections for the purpose of training physical ins and of organising playing grounds.

The Secretariat also provides the national Societies with lectures for children on health subjects, lantern slides and films dealing with questions of h infectious diseases, etc., and, further, exhibits which the national Societies propaganda purposes.

We may further mention the convening, by the Junior Section of the Le conferences and congresses designed to keep the Junior Sections of the various n Red Cross Societies in touch with each other, and to enable their representa exchange views on specific points.

All this work has not failed to produce results. There are now, in all, th national Sections of the Junior Red Cross, publishing twenty-seven reviev nearly nine million " Junior " readers.

EMIGRATION DIVISION.

Since the beginning of 1923, following requests from a number of natio Cross Societies, the Secretariat of the League has devoted its attention to conditions among emigrants, and has taken up the study of this problem.

In 1925, the Board of Governors adopted the following resolution :

" In view of the importance to the Red Cross of the protection of emi as a humanitarian duty, as a means of promoting hygiene and educatio further, as a means of strengthening the Red Cross itself, the Board of Go approves the first steps taken in this direction by the Secretariat, and recom the organisation, on permanent lines, of an Emigration Division at the Secr of the League.

" This Division shall co-operate with the International Labour Offic through the agency of that office as well as directly, with the private, natio international organisations for the protection of emigrants. It will recor that the public-health nurse should not merely take action to ensu health of emigrants before, during and after the voyage, but that she s immediately the family contemplates emigration, also give informatio guidance to its members in order to prevent their being exploited, and to

n to adapt themselves more readily to conditions in the country to which
/ are proceeding.

" This Division shall suggest the idea of supplementing the training of nurses
his purpose.

" It shall endeavour to obviate the undesirable results due to the emigration
naccompanied children.

" Finally, it shall explain to the national Societies the great advantages to
btained, through emigration protection, from the spread of the Red Cross
among the rural populations : extension of the action of the Red Cross, the
ning of its recruiting area, increased resources and the spread, in the remotest
ges and among the humblest families, of a sense of hygiene and civic duty. "

n that time, the Emigration Division has been collecting information and has
secuting the study of the question, in order to be in a position to carry out all
ıctions of the Board of Governors.

Division devotes special attention to the rôle of the Red Cross in connection
protection of emigrants, acting, needless to say, on the principle of absolute
or existing laws and regulations in all countries. Without encroaching on
ent prerogatives, there is plenty of room for helpful action. At the Inter-
Emigration Conference held in Rome in May 1924, this was expressly stated
overnments. The Red Cross can thus supply a considerable deficiency.
each country is faced with a different situation, a single programme of
bviously impracticable. The methods adopted by the national Red Cross
in their work for emigrants, the agreements between the Red Cross Societies
rious countries and those concluded with their respective Governments, the
appointing Red Cross delegates in immigrant-receiving countries to assist
on arrival, during the period of their establishment and during their stay— all
stions are being carefully investigated by the Emigration Division.

st 1926.

OFFICE INTERNATIONAL D'HYGIÈNE PUBLIQUE

REPORT

FOR THE PERIOD OCTOBER 1st, 1924, TO SEPTEMBER 30th, 1925

ADHESIONS TO TE AGREEMENT OF DECEMBER, 9TH, 1907.

ring the year 1924-25, the British Government acceded to the Agreement ing the Office international, on behalf of the Dominion of New Zealand ; Netherlands Government took similar action on behalf of the Dutch East These accessions bring the number of countries supporting the Office ional d'hygiène publique up to forty-one.

WORK OF THE OFFICE INTRENATIONAL.

report for the financial year 1922-23 stated that, in consequence of the French nent's request for a revised draft of the International Sanitary Convention ary 17th, 1912, the Office international, after a careful examination of this ion, transmitted to that Government on February 13th, 1923, proposals for ents to the clauses of this international agreement. When inviting the o attend the Health Conference in Paris on May 10th, 1926, the French Govern- nmunicated to them the draft amendments prepared by the Office inter- as a basis for discussion at that Conference. At its sessions in October 1924, pril and May 1925, circumstances led the Committee of the Office to on the motion of some of its members, how far the principles underlying the endments could be applied to the far distant countries without jeopardising onal health defence, in order that it might be able to give a reply on this the Fourth International Health Conference.

question was discussed, and the general lines on which this problem might were considered. They will be finally settled at the session of October 1925. ddition to this, the Committee supplemented one of the clauses of its draft (Article 53) by stipulations applying to emigrants—this in response to a ndation passed by the recent International Emigration Conference.

time ago, the Office international d'hygiène publique prepared a draft it providing for the free treatment of sailors suffering from venereal disease rts of call of the ships on which they are serving. The Belgian Government the Committee's draft to the maritime Powers with a view to the conclusion matic agreement on this point. The Agreement in question was signed at n December 1st, 1924; it bears the signatures of the following: the Argentine Belgium, the Cuban Republic, Denmark, Finland, France, Great Britain and Ireland, Greece, Italy, the Principality of Monaco, Peru, Roumania, Sweden . The Agreement contains an accession clause providing for the adhesion wers which have not signed it. It may be presumed that ratifications will y recorded in Brussels, and that this Agreement will come into force in the re.

entioned in the preceding report, the Committee, in a circular dated July , transmitted to the subscribing Governments a draft Agreement which it red in connection with the anti-diphtheria serum, requesting them to state hey would be prepared to accept its terms. The various Governments, proved the terms of this draft in principle, the French Government, on being d by the Committee, opened negotiations on July 3rd last, with a view to its signature.

The Opium Convention signed at Geneva on February 19th, 1925, contai provisions, in Articles 8 and 10, according to which the Office international is an opinion : (1) on preparations which, though containing narcotics covered Convention, cannot give rise to the drug habit inasmuch as such narcotics a recoverable in practice ; (2) on the extension of the provisions of the Conven such substances, other than those enumerated in Article 4 under *(a)*, *(b)*, *(c* *(e)* and *(f)*, as may be found to produce similar ill effects (Article 10). The Com which was approached on the matter by the Council of the League, proposes to take the work arising out of the above-mentioned provisions, subject to the ref of the expenditure incurred.

The standard bill of health which the Office international submitted to th scribing Governments concerned, in its circular of July 27th, 1924, with a v removing the disadvantages of certain existing practices, was favourably re in principle, by the health authorities of nineteen out of the thirty-nine m countries subscribing to the Office ; the health authorities of twelve countrie not yet given their views, and eight have made reservations, requesting that modifications be made in the draft. For the moment, therefore, this matter r on the agenda of the Office international.

An enquiry into the rodent fauna and their cutaneous parasites, which sponsible for the spread of plague, was undertaken by the Office internation the object of ascertaining the geographical distribution of this fauna, its var and its connection with outbreaks of plague. Apart from the bibliographical tigations carried out by the branches of the Office international with the ob collecting data regarding this matter, a certain number of health authoritie already supplied valuable documentary information. Thus, the minutes sessions held during the financial year 1924-25 and the *Bulletin mensuel* contai submitted by the delegates of Denmark, the United States of America, Fran Netherlands, Portugal (with reference to the home country and the Azores), S South Africa, Senegal, Egypt, Algeria, Tunis, British India, Indo-China, Jap Madagascar. In British India, supplementary investigations are now being out by the Health Services with a view to obtaining, if possible, accurate data geographical distribution and seasonal prevalence of rats and fleas, first in th in which plague has been endemic for years, and secondly in the areas in whic has never been an outbreak.

The epidemic of pulmonary plague which prevailed in Manchuria in 1 has been the subject of bacteriological research work carried out by the Ja delegate to the Committee. He gave a short account of this work in an article pu in the *Bulletin mensuel*.

Cancer has remained on the agenda of the Committee. Special reference made to the note on the inferences to be drawn from the Swiss mortality st (giving an account of the ravages of this disease in that country and of its lo tribution), the reports on deaths caused by cancer in Spain from 1900 to 1920, on the work of the Cancer Committee of the British Ministry of Health, and the of enquiries on cancer of the breast and of the uterus in England, Italy and the N lands. These enquiries show, unfortunately, that the proportion of cases o on at an early stage amounts to 10 per cent at the outside.

With a view to investigating the various forms of scarlet fever and the m adopted in various countries to fight this disease, the Office sent a questi to the health authorities of the various countries represented in the Office interna Replies have already been received from Algeria, the Argentine Republic, Au Denmark, Great Britain and Northern Ireland, British India, Italy, Jap

ality of Monaco, the Netherlands, Norway, Peru, Portugal, Roumania, Sweden, the United States of America and Uruguay.

th regard to cholera, the Office international thought it desirable to review wledge gained since the International Sanitary Convention of January 17th, especting the causes for the outbreak and spread of cholera, the part played iers, and the results of preventive vaccination. A report submitted at the ssion was published in the *Bulletin mensuel* for August 1925 (page 864). The nclusions arrived at in this report are that man is the principal agent concerned pread of cholera, and that two fresh prophylactic measures might be contem- namely, the strict supervision of convalescents, and preventive vaccination ises where an epidemic has begun or where there is danger of contamination. e Committee was given information on the small epidemic of mild smallpox vailing in England, and on that which, beginning in 1921, is now coming to in Switzerland, where only a few very small isolated foci remain. The mild the disease prevailing in both countries has given an opportunity for investi- whether " alastrim " is a well-defined disease *sui generis*, or whether it is by its nosological features, to the smallpox family. These investigations he conclusion that any manifestation of an eruptive fever of the smallpox ust be notified in the same way as smallpox, and requires prophylactic treat- such, with the possible exception that the drastic character of costly sanitary s may be mitigated if the development of the epidemic demonstrates the mild r of the disease.

orts have been received on sleeping-sickness in the Portuguese African pos- (Angola, the Island of San Thomé and Mozambique) and on the enquiry into ixis carried out in the Cameroons by the French Colonial Health Service, on rrent fever caused by Obermeier's spirochetes in British India, and on its g geographical distribution in Africa, on the epidemiology of yellow fever ench West-African Colonies, and the investigations of the Committee recently d in British India to combat kala-azar, and on the anti-malaria campaign in car. Information has also been received on the incidence of trachoma in ntine Republic and on the organisation set up on June 24th, 1924, in the tates of America for the purpose of fighting this disease.

ts session in April 1914, the Committee endeavoured to obtain information geographical distribution of leprosy foci and the methods of treatment applied sease. It would seem opportune, particularly after the Conference on Leprosy is held at Strasburg in 1923, to place this question once more on the agenda to collect information as to the manner in which the campaign against this now being conducted, and to examine the measures which can be applied, ry, to prevent it from spreading. Information has also been obtained with Algeria, the Argentine Republic, Egypt, British India, the Dutch East Indies, na, Italy, Korea, New Caledonia and Norway. The enquiry thus begun roceeded with.

der to complete this brief account of the work of the Office international, be added that, during the period under review, the *Bulletin mensuel* continued French translations of the laws, regulations, decrees, decisions, etc., adopted ious countries, whenever it was able to procure the texts. From October 1st, September 30th, 1925, forty-five texts of laws or regulations were published anner. These documents relate to sixteen countries or groups of countries e Republic, Austria, Brazil, France, French Colonies, Madagascar, New , Germany, Italy, Japan, New Zealand, Netherlands, Spain, Switzerland, South Africa, Uruguay). In addition to these, the statistical summaries

on the general death rate published by the *Bulletin* covered twelve countries: Au
1919 ; Belgium, 1920 ; Czechoslovakia (towns of 10,000 inhabitants and upv
1923 ; Denmark, 1920-21 ; France, 1919 ; Germany, 1921-22 ; British India, 19
Italy, 1918 ; Portugal, 1914-16 ; Scotland, 1920 ; United States of America, 19
Uruguay, 1918-19. To enable comparisons to be made between these sta
it is highly desirable that the forty-one countries represented on the Office intern
should, by co-operating closely on health questions, adopt without delay the an
nomenclature of causes of death fixed in 1920 by the International Noso
Committee, and communicated by the French Government, on August 22nd
to the various Powers represented on that International Committee.

September 1925.

INTERNATIONAL HEALTH BOARD

OF THE

ROCKEFELLER FOUNDATION

ring the year 1925 the International Health Board gave assistance to public enterprises of various types in ninety-seven States and countries. It parti- in infection and sanitation surveys, operations for the control of yellow fever okworm disease, field studies and experiments in malaria control, county al work, the development of special divisions of public health services, and the ument and maintenance of schools and institutes of hygiene and public health. provided 197 fellowships for training in public health for men and women enty-seven countries, supported field stations for the training of prospective fficers in methods of malaria and hookworm control and in other public health nd contributed funds to the Health Section of the League of Nations toward ort of international interchanges of public health personnel, the maintenance pidemiological and Public Health Intelligence Service, and the training of nent health officials in vital and public health statistics.

Yellow Fever.

low fever surveys made during the year in Venezuela, Peru, Ecuador, and the American countries showed these regions to be entirely free of the disease. area in the Western Hemisphere in which yellow fever cases were reported vas the northern part of Brazil. Campaigns against the yellow fever mosquito nducted, in co-operation with the Governments, in eleven of the Brazilian nd as a precautionary measure, in the Central American Republics of Salvador, la, Nicaragua and Honduras. During the year, a Yellow Fever Commission to West Africa to make surveys and laboratory studies in that region.

Malaria Control.

stance in malaria control demonstrations was given in twelve States of the tates ; in Porto Rico ; in the State of Rio de Janeiro, Brazil ; in the province nan, Argentine ; in two areas in Italy ; in Palestine ; and in the Philippine Malaria surveys were made in Haiti, Nicaragua, and Costa Rica. In Ceylon of the Board's staff conferred with the Government regarding the local roblem.

Board continued its support of the training post for malariologists at Leesburg, It also contributed towards the operating expenses of a training station (Corsica) for French-speaking malariologists, which is organised on a plan that of the Leesburg station and is directed by Dr. Emile Brumpt, Profes- rasitology in the University of Paris.

-operation with the National Department of Health of Brazil, an intensive malariology was conducted which was attended by representatives of the tary services of six States. The course covered a period of sixteen weeks, thirty-one days were devoted to lectures and laboratory work, twenty- to field excursions, and twenty-seven days to a survey and the preparation ect for malaria control in a designated area. Training courses were also he Philippine Islands and in Italy. The health demonstration in Mokotow Varsaw, Poland, toward which the Board is contributing, serves as a malaria tation for students of the School of Public Health.

esearch work at the Leesburg station during 1925 included (1) the treatment s by induced malaria, (2) experimental infection of Anopheles mosquitoes, tion of wild mosquitoes to determine natural infection, (4) observations ito dispersal, (5) study of the results of intensive medication with quinine,

(6) observations on the periodicity of malaria parasites in the peripheral (7) study of Halteridium infection of pigeons, (8) observation of the charact of Anopheles ova, (9) recognition of the sex of Anopheles larvæ, (10) study parasites of Anopheles mosquitoes.

At Andalusia, Alabama, under the direction of Dr. W. G. Smillie, studi made of the relationship of impounded reservoirs to malaria epidemics and effectiveness of various measures used in malaria control. A study of quini made by Dr. R. W. Hegner at the Johns Hopkins University School of Hygie Public Health, and research on combinations of quinine with arsenic was carr by Professor Franz Erben in Austria.

Mr. F. W. Root, of the Department of Medical Zoology of the Johns H University School of Hygiene and Public Health, spent six months of the Brazil, making a study of the Anopheles species of the country and deve with a Brazilian entomologist, laboratory and field methods of identifying mosq

Relief of Hookworm Disease.

Aid in hookworm control operations was given to the Governments of ei countries, and hookworm surveys were made in nine countries. In Mexico th tion survey, undertaken in April 1924, was brought to a close in January 1925. study, which was extended to seven States, showed hookworm infection wide valent in the tropical regions of heavy rainfall, but non-existent on the hig plateaux. Mass-treatment campaigns were completed in eleven areas of th of Vera Cruz during 1925. About 46,000 persons were treated.

In Central America, control measures were carried out by the Governm Nicaragua, Guatemala, and Panama with some assistance from the Board, in personnel.

In the East, co-operation in hookworm work was given in the Madras Presi India, in Mauritius, Ceylon, Siam, Java, Fiji, Rarotonga, Tonga, and the New He Early in the year, the Board withdrew from Fiji and Mauritius, and the Gover of these areas assumed entire responsibility for the work. In Fiji, surveys ma year after mass-treatment had been completed showed that the intensity of in had been greatly reduced.

A study of the epidemiology of hookworm infection in China was made W. W. Cort. Dr. P. D. Lamson continued his studies of the pharmacology of tetrachloride at the Johns Hopkins University. The following problems were tigated at the Board's Field Research and Training Station in Andalusia, Ala under Dr. W. G. Smillie : racial, economic, and social factors affecting hook intensity ; comparative accuracy of the Stoll and the Clayton Lane technics i hookworm infection ; simpler methods of measuring hookworm intensity ; ph fitness in children with varying degrees of hookworm infection.

Assistance to County and District Health Units.

Co-operation was given to the development of county health work in 220 co in twenty-six States of the United States, in eight counties in the State of Sao Brazil, in five counties in the State of Minas Geraes, Brazil, and in the provi Bulacan, Philippine Islands. Assistance was also given in establishing health s in the department of Herault, France, in the district of Hartberg, Austria, and Skierniewice District and the Mokotow District of Warsaw, in Poland. The of Bahia, Brazil, was aided in organising a county service by the loan of per to assist in the work.

Public Health Laboratories.

in the development of public health laboratory services was given in twelve
the United States and in Costa Rica, Guatemala, Nicaragua, Salvador, the
ie Islands, and China. In Costa Rica a Central Laboratory was officially
n April 1st, the Board contributing the services of a director and funds for
it and supplies over a two-year period. On October 1st the Government
r the direction of the Laboratory and the Board's representative was with-

Aid to State Health Services.

States of Alabama, Kansas, Rhode Island, Tennessee, Utah, and Virginia
d in extending their epidemiological services. Alabama, Mississippi, Montana,
, Texas, and West Virginia received aid in strengthening their systems of
istics. Colorado, Connecticut, Idaho, Maine, Montana, and Utah, and the
of Honduras and Nicaragua were assisted in establishing divisions of sani-
neering.

Public Health Education.

ributions were made to the School of Public Health of Harvard University,
l of Hygiene and Public Health of the University of Toronto, the Institute
e at Sao Paulo, the Medical Faculty of Bahia, the State Public Health Insti-
ague, the School of Public Health in Warsaw, the London School of Hygiene
ical Medicine, the Institute of Hygiene in Budapest, the School of Public
Zagreb, Kingdom of the Serbs, Croats and Slovenes, the Central Epidemio-
stitute in Belgrade, Kingdom of the Serbs, Croats and Slovenes, the State
stitute in Copenhagen, and the Imperial College of Tropical Agriculture in

eration was given to the National Department of Health of Brazil and to
itional d'hygiène sociale of France in the development of public-health
On June 19th the Brazilian School of Nursing graduated its first class,
thirteen students. On June 30th the school had a registration of fifty-four.

Fellowships.

ifrequently a Government has need for a man to take charge of an important
public health programme, but is unable to find anyone with the required
owledge. Under such circumstances the Board is inclined to award a
to some promising resident of the country, provided the Government
ls him and assures him an important public-health post on his return from
. The Board's interest is in the position to be filled and the public which
ved rather than in the individual awarded a fellowship. Fellowships are
not more than one year, but some are renewed.
5, the Board awarded a total of 147 fellowships. Of these, fifty-eight were
the Americas, including twenty-nine in the United States; seventy-one
ropeans and eighteen to the East. In addition to these fellowships, fifty-
lowships were awarded for study within the student's own country. Eleven
llowships were allotted to Hungary, four to Italy, and thirty-five to the
f the Serbs, Croats and Slovenes.

THE HEALTH ORGANISATION

OF THE

LEAGUE OF NATIONS

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I. CONSTITUTION.

The Health Organisation of the League of Nations consists of :

(1) A General Advisory Health Council ;
(2) A Standing Health Committee ;
(3) A Health Section of the Secretariat of the League of Na

I. The Committee of the Office international d'hygiène publique wi the General Advisory Health Council. The Office international d'hygiène will remain autonomous and retain its seat in Paris without any modificati constitution or functions.

II. The Standing Health Committee will consist of the President of the Co of the Office international d'hygiène publique and fifteen other members health experts or officers). Nine of these members will be appointed ind for three years by the Committee of the Office international d'hygiène publiqu a way that each State which is a permanent Member of the Council of the L Nations is represented on the Standing Health Committee. The remai members will be appointed, also for a period of three years, by the Counc League of Nations after consultation with the Standing Health Committe

The Standing Health Committee may be supplemented by the additio more than four public health experts as assessors ; these assessors will be a by the Council of the League of Nations on the nomination of the Standing Committee and will be considered as fully effective members.

General Advisory Health Council.

I. The General Advisory Health Council will consider, discuss, advise on any question which may be submitted to it by the Standing Health Co of the League of Nations.

II. It will initiate and transmit to the Standing Health Committe League of Nations any question which it may consider will be advanced b procedure.

III. The Health Section of the Secretariat of the League of Nations Office international d'hygiène publique will keep closely in touch. Each will nicate to the other all documents relating to its work.

A copy of each of these documents will be sent direct to every membe Committee of the Office international d'hygiène publique and of the Standing Committee of the League of Nations.

IV. Supplementary expenses incurred by the Office international d publique as the result of requests from the Council of the League of Nations defrayed by the General Secretariat of the League.

Standing Health Committee.

I. The Standing Health Committee will direct the health work of the of Nations, and, in particular, it will, through a Medical Director, direct t of the Health Section of the Secretariat.

II. It will consider and report to the Council of the League of Nations public health question concerning the League of Nations which may be subm it or initiated by the Standing Health Committee itself.

It has the right to appoint special committees to consider any enquiry, or other public health matter and it has the power to add to such special mittees any outside person whose qualifications it may consider will further ›ose aimed at.

re are at present eleven such special commissions, which are as follows :

1. Public Health Training Commission.
2. Far East Commission.
3. Malaria Commission.
4. Cancer Commission.
5. Tuberculosis Commission.
6. Opium Commission.
7. Temporary Mixed Anthrax Commission.
8. Commission on Standardisation of Sera, Serological Reactions and Biological Products.
9. Commission of Experts for the Study of Sleeping-Sickness and Tuberculosis in Equatorial Africa.
10. International Sleeping-Sickness Commission.
11. Smallpox and Vaccination Commission.

In order to enable the General Advisory Health Council to fulfil its duties, ding Health Committee will forward to the President of the Committee of e international d'hygiène publique a yearly report relating to the work carried he Health Organisation of the League of Nations during the preceding year. ›rt will also set out the questions with which the Standing Health Committee to deal, to the extent of its competence as defined by the Council and the y of the League of Nations.

Health Section of the Secretariat of the League of Nations.

Health Section of the Secretariat of the League of Nations will form the at of the Health Organisation of the League.
ill be under the direction of the Medical Director.
functions and duties of the Health Section will be those laid down by the Health Committee subject to approval by the Secretary-General of the League ıs.

II. WORK OF CERTAIN COMMISSIONS.

1. Commission on Public Health Training.

aims of this Commission are to determine what factors, derived from public struction, can best conduce to the improvement of human well-being, and ake any claim to judge of the merits of the different systems of public health ›n employed at universities. Its method : not to direct its enquiries towards ing the intrinsic value of university programmes, still less the merits of the esponsible for carrying them out, but to analyse the results obtained from ent types of public health instruction, their influence upon medical education, practical effect on the public in general, by carrying out personal and first- uiries in an impartial and scientific spirit, such as will enable all university ·s and administrations to realise the high aims of the mission which has been en.

Imbued with this spirit, members of the Commission carried out a fir study of the various systems of public health instruction in use in the univ and technical colleges of a number of countries. The impressions received course of these tours are given in the reports of Professor Ricardo Jorge on H Professor Ottolenghi on Switzerland and Syria, Professor Madsen on Swed Norway, and Dr. Chodzko on Denmark and Roumania.

In the summer of 1925, Professor Léon Bernard went to Brazil, the Ar Republic and Uruguay to carry out a similar investigation there.

In April 1926, the Commission held a meeting at Warsaw, where it had been by the Director-General of the Polish Public Health Service to assist at the inaug of the new school of health attached to the State Institute of Health already e at Warsaw. At this meeting, the Directors of the health schools of London, I Belgrade and Zagreb attended. After a discussion on the prospective progr of these schools, it was decided that the Commission should endeavour to col the documents concerning the health schools already existing in Europe a United States, and to facilitate a mutual co-operation between these new bo means of an exchange of views between their Directors.

2. Malaria Commission.

The Malaria Commission, after embodying in a general report (C.H. 27 observations made during its study tour of 1924 in the Kingdom of the Serbs, and Slovenes, Greece, Roumania, Bulgaria and Russia, found it necessary to co their studies by new investigations in the Mediterranean countries.

The first study tour thus undertaken in Egypt, Palestine and Syria (Ma was interrupted by a tragic accident. The observations made in the course tour were given in Report C.H./Malaria/52.

Additional study tours were also made in Spain in August and September same year (C.H./Malaria/58), and in Sicily in September and October 1926.

The final report, summarising the views of the Commission on the various m of malaria control, is now being drafted by Colonel James, acting as " Rappo of the Commission.

Besides these tours made by the Commission itself, several field investi were carried out by individual members ; in Corsica, at the request of the Government, by M. Marchoux and M. Raynaud, and in the Kingdom of the Croats and Slovenes by Professor Nocht.

These special investigations have enabled their authors to give valuable to the Governments concerned.

Alkaloids of Cinchona.

The world's production of quinine being quite insufficient for effective m control—even when such control is limited to the medical treatment of the the Malaria Commission has undertaken the study of the therapeutic value various alkaloids extracted from the cinchona bark (quinine, quinidine, cinch cinchonidine) and of mixtures of these alkaloids (" quinetum ").

Clinical experiments were carried out in Italy, the Kingdom of the Serbs, and Slovenes, Roumania and Spain on a uniform plan ; they dealt with the v types of malarial parasites. They showed that the therapeutical value in the ment of malaria of the mixture " quinetum " (quinine 15 per cent, cinchonidine

ıchonine 25 per cent, quinidine 5 per cent, quinoidine 20 per cent) was equal of quinine.

Commission is also investigating the sterilising action on the plasmodium ine derivatives and of hydroquinine.

Laboratory Researches.

portant laboratory researches have been successfully carried out by several s of the Commission.

onel James, in his report on *Artificially induced Malaria in the Treatment of Nervous Diseases* (C.H./Malaria/57), has clearly defined the conditions neces- the infection of the anopheles and of the transmission of infection to man. shown that few mosquitoes were able transmitters of malaria, but that, on r hand, infected mosquitoes kept up for a long time their infective properties ld withstand a rigorous winter. This hibernation may explain many cases ; infection in man.

fessors Cantacuzene, Ottolenghi and Pittaluga have studied, in the deltas anube, the Po and the Ebro respectively, the conditions of life of anopheles s inhabited and uninhabited by man.

er laboratory researches were made, under the leadership of Professor Nocht ıstitute of Tropical Medicine of Hamburg, on the distribution of sporozoites ıfected mosquitoes, on the biology of microgametocytes in the circulating ıd on the ætiology of malarial hæmoglobinuria.

fessors Cantacuzene and Zotta of Bucarest studied the resistance of anopheles ı frozen ponds. Together, with Professor Swellengrebel, they tried to ı whether the infectivity of the anopheles could be influenced by the saline of their breeding-places.

fessor Swellengrebel carried out similar experiments in Holland. He also the influence of the construction of polders on malaria prevalence, while r Ottolenghi, at the station of Ferrara, studied the influence of major sani- ısures (" grandi bonifiche ") on this prevalence.

Special Courses of Malariology.

n certain countries the health administrations were hampered in their attempts ia control by the small number of physicians possessing an expert knowledge bject, the Malaria Commission decided to remedy this situation by organising ourses of malariology. These courses were given for the first time in June ıder the direction of Dr. A. Balfour and of Professors Brumpt and Nocht, ıree Institutes of Tropical Medicine of London, Paris and Hamburg.

theoretical teaching and the laboratory training were given in these insti- forty-nine physicians belonging to twenty different countries. Several of ceived scholarships from the Health Organisation.

t of them, at the end of the theoretical course, were for two months given an ıity to acquire practical training through a study tour in Corsica, through a stay at the anti-malarial stations organised in Sardinia and in the Roman ıa by the Italian public health authorities in conjunction with the Rocke- ıundation, at the three Serb-Croat-Slovene stations of Skoplje, Trogir and or at the Spanish station of Navalmoral de la Mata.

se malaria courses were highly appreciated both by the participants and by tary Administrations who had sent them. It was therefore decided, at their that the courses should be repeated in 1927.

3. Cancer Commission.

The enquiry undertaken under the auspices of this Commission has a limited object, namely, to determine the causes of the considerable differences official statistics of Great Britain, the Netherlands and Italy as regar mortality rate of two special forms of cancer, namely, cancer of the breast and of the uterus.

These two varieties of cancer were selected because they represent nec forms which are so clear and distinct that it is unlikely that the deaths resultin them fail to be attributed to them in official death-rate statistics.

The three countries in question were chosen both because their systems o registration are well organised and have been in operation for several years a because the death-rate in Great Britain from these two varieties of cancer is greater than the mean death-rate from the same causes in Holland and Italy.

The statistical enquiry was carried out in close co-operation with a specia mittee of statisticians appointed for that purpose, which included Drs. Gree and Methorst, Professors Pittard, Niceforo and Deelman and Dr. Lane Clay

It was important, as a first step, to throw light on the question wheth observed differences between the three countries under consideration were real to artificial statistical data. It was found, as a result of research based on th modern methods of calculation, that these differences were real.

This point having been established, the methods of statistical analysi applied to the study of the possible correlation between personal status and th tality rate of cancer of the breast and of the uterus in the three countries in qu the relation between this mortality rate and fecundity, between the general deat and the cancer death-rate, etc. The following conclusions may be deduced fr results of these investigations ; among unmarried women the death-rate from of the breast is highest and the death-rate from cancer of the uterus is lowest. incidence of cancer of the breast and of the uterus is in inverse proportion number of children born. The differences noted in the incidence of cancer in di parts of the same country are sufficiently marked in all three countries to be of from a statistical point of view. It is therefore necessary to make a detailed of the geographical distribution of cancer.

The clinical enquiry was carried out on uniform lines in England, Italy a Netherlands. It was decided to ascertain the clinical antecedents of a num women suffering from cancer of the breast and an equal number of women of sponding ages showing no symptoms of a neoplastic affection. For this purpose was prepared and was distributed to a number of hospitals. As yet the Comm has only been able to examine in detail the results obtained in England a Netherlands. It endeavoured in particular to discover the incidence of abort the two classes of women examined, the possible influence of heredity. lactatio ages at which menstruation and menopause appear and the occurrence of t during parturition.

Special attention was given to the question of surgical treatment, and it was that as a rule such treatment prolonged the lives of patients by at least three and sometimes, under favourable conditions, by as much as ten years.

In October 1925, the Statistical Sub-Committee of the Cancer Commission Professor Niceforo and Professor Pittard to study the possible relation between and the racial factor, and to prepare a preliminary report on this question. Fo report two kinds of information were necessary : statistical data on cancer mor in certain selected countries, and anthropological data for these countries.

The data as regards cancer mortality were collected by the Secretariat, an necessary anthropological information by the Rapporteurs themselves.

was observed, in the preparation of the necessary statistical information, that countries the rate of mortality from cancer was extremely low in certain s, whereas in the same regions mortality from senility or from unknown causes nparatively high. This discovery suggested a further investigation into the ative mortality rates from these causes ; this enquiry was carried out in April y 1926. Dr. Greenwood (Great Britain), Dr. Hansen (Denmark), Professor st (Netherlands), and Dr. Carrière (Switzerland) were accordingly asked to ke similar studies, in order to discover whether there might not be an inverse between mortality from cancer and mortality from senility or unknown

ommission on the Standardisation of Sera, Serological Tests and Biological Products.

der the auspices of this Commission researches for the standardisation of the g matters are now proceeding :

(1) Medical Sera ;
(2) Medicaments ;
(3) Serological Tests ;
(4) Tuberculin.

ring the year 1926, important experiments for the standardisation of medical re completed. While a Conference held in September 1922, at Geneva, had adopted an international standard for anti-diphtheric serum, differences on still prevailed as to the adoption of an international standard for anti- ry and anti-tetanus sera. At the session which the Permanent Committee on disation and the Sub-Committees on Tetanus and Dysentery held at Geneva ber 1926 these differences of opinion almost completely disappeared. As anti-tetanus serum, the introduction of an international standard was decided y common agreement.

to anti-dysentery serum, the Sub-Committee on Dysentery had already selected, ting held in September 1924 at Geneva, a method which was used for titration standardised serum prepared by the Danish State Serum Institute at Copen- These experiments had yielded such good results that the value of the process d at the Danish State Serum Institute was universally acknowledged. In owing year, further experiments were made by the same method, with a view ting the Copenhagen Standard as the international standard.

tly, we should mention the experiments for the standardisation of tuberculin, were carried out by Professor Calmette, of the Pasteur Institute at Paris, commendation of Dr. Tsurumi, Chairman of the Tuberculosis Commission. h the methods tried (determination of complement, process of flocculation, nation of toxicity by means of intravenous injections on guinea-pigs, skin tuberculous subjects, subcutaneous tests on animals) do not yet seem suitable as international processes of standardisation, Calmette favours the method utaneous titration, on the animal, with a standardised tuberculin. During mission's session of October 1926, it was decided to proceed, for tuberculosis, nparative study of the standards of Paris, Frankfort and Japan, using this

disation of Certain Remedies, the Activity of which is tested by Biological Method.

s question was discussed at two Conferences, held at Edinburgh in July 1925, Geneva from August to September 1925.

As regards pituitary extract, the dry substance of the posterior lobe of the tary gland was recommended as the international standard.

For insulin, a dried preparation of insulin hydrochloride was adopted international standard ; the Insulin Committee of Toronto had found that 1 gramme of this preparation represented 8 units of insulin.

For digitalis, a dry powdered preparation of a fixed strength was recomm as the standard.

As regards the arseno-benzols, the Conference adopted the principle standardisation of salvarsan in relation to a permanent standard preparation.

For the standardisation of thyroid gland substance, the Conference though a biological method was not necessary, as the determination by means of iodine a sufficiently exact indication as to the amount of active thyroid gland sub contained.

The Conference has as yet taken no final decision as regards the standardi of ergot. Further study must be given to biological methods and the ch method advocated by Straub.

As regards oil of chenopodium and vitamins, particularly the growth-pron factors, definite proposals for their standardisation cannot be submitted until f tests have been made. It is also proposed to start investigations on metho the biological standardisation of paratyphoid and ovarian extracts.

Lastly, we must mention the decisions regarding the international super of the traffic in secret remedies and certain proprietary remedies. All the dec adopted by the second International Conference for Biological Standardisation submitted to the second Conference for the Unification of Heroic Drugs, whic on September 21st, 1925, at Brussels, and which submitted, among others, a recon dation to the effect that, so far as necessary, biological standardisation shou adopted in the pharmacopœias and the latter should indicate the methods recomm by the Health Organisation of the League of Nations, provided there was no s reasons to the contrary.

5. Commission of Experts for the Study of Sleeping-Sickness and Tubercu in Equatorial Africa and International Sleeping-Sickness Commissio

At a meeting held in London in September 1924, the Commission of Ex for the Study of Sleeping-Sickness and Tuberculosis in Equatorial Africa empha the importance of sending a special mission to some district in which slee sickness was prevalent, for the purpose of studying certain problems which a capital importance for the prevention and therapeutic treatment of this disea

An International Conference on Sleeping-Sickness was convened in Lond the Colonial Office from May 19th to 22nd, 1925, to discuss the desirabili sending such a mission to Africa.

This conference was composed of delegates from Belgium, France, Great Br Italy, Portugal and Spain (document C.H. 334). The administrative recomm tions adopted at the Conference referred to the relations to be established bet medical officers and administrative staffs stationed on both sides of frontiers introduction of a sanitary passport for natives desiring to cross from one cou to another and the desirability of a uniform method of recording cases of slee sickness.

The Conference further recommended that an international commission sh be formed to study in Equatorial Africa a number of problems relating to the e miology of sleeping-sickness, such as the existence of any human immunity

somiasis, the comparative value, from a curative and prophylactic point of f trypanocidal agents, and the part played by animals as virus reservoirs. arranged that the International Commission should spend a year at Entebbe, e Victoria, as the Government of Uganda had been good enough to inform ncil that it was prepared to place the laboratory there at the Commission's for a year. At the end of that period, the Commission would submit a o the Health Committee. The town of Entebbe is very favourably situated study of the subjects which, in the Conference's opinion, are likely to lead crease in our knowledge of the prophylaxis and treatment of sleeping-sickness. tly, the Conference decided to request the Governments concerned to contri- a common fund to cover the cost of the expedition and recommended that these nents should endeavour to provide at least £3,000 to be placed to the credit Iealth Organisation's budget for 1926 for purposes of the Commission's work. its session in June 1925, the Council approved the resolutions of the Interna- Conference on Sleeping-Sickness, which were submitted to it by Viscount To cover the expenses of the expedition, certain Governments generously o contribute to a common pool. The Belgian Government promised 100,000 he French Government 50,000 francs, the Spanish Government 4,000 pesetas, uguese Government £500 and the British Government £2,050. In addition, of £2,000 was provided in the budget of the Health Organisation for 1926. experts chosen as members of the Commission [1] met at Entebbe at the begin- February 1926 and are now carrying on their researches along the lines laid the London Conference. The Government of Uganda has generously placed ties at the Commission's disposal for its work, and there is every reason to hat the research work thus jointly undertaken on an international scale will increase our knowledge of the prophylaxis and treatment of sleeping-sickness, uses such widespread ravages in certain parts of the continent of Africa.

6. Smallpox and Vaccination Commission.

he fifth session of the Health Committee, a Commission which included experts veral countries was formed to study various problems connected with the of smallpox and preventive anti-smallpox vaccination. This Commission une 1926 at The Hague and examined the relations between the various forms pox in animals and in man, and also the connection between serious forms pox proper and the slight forms, known as " alastrim ".

onsequence of the appearance of cases of post-vaccinal encephalitis in various s, the Commission devoted particular attention to questions of preventive llpox vaccination and also to the standardisation of vaccinal lymph.

ation tests carried out at the Vaccination Institutes of Berlin, Berne, Lille don, with samples of lymph according to the methods of Calmette-Guérin, oth and Sobernheim, have already made it possible to arrive at provisional ns. Moreover, the Health Section has received numerous replies to the naire on the preparation of lymph in the vaccination institutes. The results tained will be discussed at a meeting which will take place in December 1926.

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[1] Duke, Head of the Entebbe Laboratory (Chairman); Dr. Lavier, of the Parasitological Laboratory of the Paris; Dr. van Hoof, Head of the Leopoldville Laboratory (Congo); Dr. M. Prates, Head of the Lorenzo- oratory (Mozambique), and Professor Kleine, of the Robert Koch Institute, Berlin.

III EPIDEMIOLOGICAL INTELLIGENCE DEPARTMENT.

1. Publications.

(a) *Epidemiological Intelligence Reports.*

In 1921, the Health Section set itself the task of collecting all available in tion in regard to the prevalence and movement of certain epidemic diseases in Europe, where the situation was critical. The collection and tabulation of this in tion aided materially as a guide for the application of preventive measures, a no doubt one of the means which led to the successful issue of the campaign. reports of the Epidemic Commission much of the epidemiological informa collected is summarised, and three volumes of reports were also issued, the firs ing the epidemic disease situation in Eastern Europe (in 1921) as a whole, a second and third containing detailed accounts of the movements of epide Russia. Three other volumes were published describing the epidemic disease tion in Eastern and Central Europe in 1922. In the same year the Intern Health Board of the Rockefeller Foundation showed an interest in the work of ing and distributing epidemiological intelligence by providing the Health Com with a generous grant-in-aid as from January 1923. In July 1923 the first m report on the occurrence and prevalence of notifiable diseases was issued, an that time this publication has been continued, including each month a larg of the world and more complete and detailed information. Because of the ne of collecting and distributing the material rapidly, provisional data are frec used. It is highly desirable that exact data be provided, however, and f purpose an annual report is issued containing a summary of the material pu in the monthly reports, but corrected by the public health services of the countries.

(b) *Annual Reports on Notifiable Diseases.*

The first annual report of this kind was issued in 1923 and related to th fiable disease situation in European countries during 1922. In 1924 a report was summarising the data received in 1923 and including a larger area of the worl had been possible in previous reports. The report issued in 1925 covered th 1924 and contained important data on the movement of epidemics, the prev of notifiable diseases and certain mortality statistics from 29 European, 20 Am 17 African and 16 Asiatic countries, and Australia. The summary at the beg of the volume gave a brief review of the behaviour of the more important ep diseases in 1924 as contrasted with the records from 1919. This feature of the report on notifiable diseases has been of considerable value to those who de secure quickly a comprehensive grasp of the prevalence of notifiable diseases world. The material for these reports is furnished voluntarily by the public services of various countries and cities wherever this information is available information now being regularly received relates to over 60 per cent of the population. The significance of these monthly and annual reports is that furnish in accessible form information not hitherto available. Theirvalue lies practical use to which the information they contain may be put by public health nistrations and the light they reflect on certain characteristics of epidemic disea otherwise discernible. The geographical distribution, seasonal prevalence, di tion by age and sex, and lethality in various parts of the world reveal differe

aviour of disease which cannot fail to throw light on epidemiology and on. Eighty-six numbers of the *Monthly Epidemiological Report* have been ıcluding the twelve published in 1925. The contents now include telegraphic ion from a large area in the Far East, where plague, cholera and smallpox ıportant, reports on the existing prevalence of notifiable diseases, rates of ıeral and infant mortality and current reports on mortality from specified certain large cities. A feature added in 1925 was the monthly publication ı meteorological information, including mean temperature of the air, relative , and the rainfall in millimeters for over a score of the most important cities rld. The student of epidemiology who is interested in the relation of meteoro- nditions to disease may find in the monthly reports ample and well-digested for study.

2. The Eastern Intelligence Bureau at Singapore.

ng the August 1922 meeting of the Health Committee, Dr. Miyajima pro- at a small mission should be sent to the Far East to collect information ıg the incidence and prevention of the more serious epidemic diseases which ed international problems. The Health Committee received the proposal ly, and, with the approval of the Council, despatched the Epidemic Commis- a tour of the principal ports of the Far East, from November 1922 to July is report recommending the establishment of a Bureau for the receipt and of epidemiological information was approved by the Health Committee and cil in 1924, and an International Conference was convened at Singapore er the work of the proposed Bureau and frame its budgetary estimates. erence was held from February 4th to 13th, 1925.

Bureau at Singapore started its work on March 1st, 1925, and now serves a e area, which extends as far west as Cape Town and Alexandria and as far onolulu, and it has been found advisable to divide the corresponding admi- ıs into four groups. There is a Western Group, which stretches from the t of Africa and the Asiatic Coast as far east as, and including, British India ; Group, which comprises the Malay States, the Dutch East Indies, Borneo hilippine Islands ; an Eastern Group, which includes the Asiatic coast from Siberia, with Japan and Formosa ; and, finally, a Southern Group, which Australia, New Zealand and the South Sea Islands.

the essential task of the Bureau to collect by cable information on the preva- pidemic diseases in the various ports, to obtain information regarding the ts of infected ships, to classify this information and re-telegraph it in the eekly bulletins. The bulletins are broadcasted every Friday free of charge ench station at Saigon. They are then relayed free of charge by the wireless ıt Malabar (Java), Sandakan (British North Borneo), Bombay, Madras, and Karachi (British India).

ME for the Foundation of a Centre of Epidemiological Intelligence on the African Continent.

s sixth session, the Assembly of the League of Nations adopted the following :

" The Second Committee,

" Having in mind the gravity and the prevalence of endemic and epidemic diseases in West Africa, and the international danger arising herefrom,

"Recommends the Assembly to request the Health Organis
the League of Nations to study the possibility of establishing a
and epidemiological bureau on the West Coast of Africa."

The Health Committee, having been requested by the Council of the L
Nations to examine this proposal, instructed the Medical Director of the
Section of the League of Nations Secretariat to proceed to an enquiry into th
tages and possibility of establishing a health bureau for the countries on t
Coast of Africa.

At its meeting of June 1926, the Health Committee, feeling that the epi
gical information would be more valuable if it covered all the countries o
decided to pursue the enquiry by considering, in greater detail, what kind
such a bureau might most usefully undertake if it were established at Algi
instructed one of its members, Dr. Lucien Raynaud, Inspector-General of the
Health Services, to consider in what conditions the centralisation of epidem
information might be carried out and to make an estimate of the possibili
difficulties of sending messages by cable and wireless. Lastly, after having
the report submitted by Dr. Raynaud, the Health Committee decided, at its
of October 1926, to ask Dr. Raynaud to establish an experimental bureau at
and to grant him for that purpose the sums necessary to cover the expense
bureau.

IV. INTERCHANGES OF PUBLIC HEALTH PERSONNEL.

1. Collective Study Tours.

One of the duties of the Health Organisation is to promote international
ration in the field of public health. The system of interchanges of public
personnel is designed to promote such co-operation, and successive Assembli
approved this work, which was one of the main items in the programme of the
Committee at its inception, viz.: "to bring administrative health autho
different countries into closer touch with each other." The Health Commi
endeavoured to develop this work by means of collective study tours of publi
officers and by missions for individual medical officers of health in special case
system of interchanges was initiated in October 1922 through the generosity
International Health Board of the Rockefeller Foundation, which granted a
tion to finance the first study tours and has continued to show an active int
this part of the Health Committee's programme by continuing and increa
contribution. The Assembly has also voted increasing credits for this purpo
the League's budget.

Two types of interchanges have been held by the Health Committee:

(a) Those intended for health officers responsible for general
work;

(b) Those restricted to health officers with special interests,
tuberculosis prevention, child hygiene, medical inspection of school-c
and port sanitation.

Organisation of Collective Interchanges.

During the Health Committee's spring session, the programme of interc
for the succeeding year is established. Letters are despatched to all public

trations calling attention to the interchanges which the Health Committee s to hold, setting out the conditions which govern the interchanges and inviting ions. Those public health officers who appear to be the most suitable candi- e selected, having due regard to the needs of the public health services to which e attached and the personal qualifications of the candidates. The public ervices of the countries to be visited draw up a detailed programme in co- n with the Health Section, and as much documentation as possible on their tion and administration is distributed to the candidates before the interchange The interchange lasts from five to seven weeks, and in the past the number cipants has varied from nine to thirty. One or more countries are visited g to their area and the interest they present from the public health point of The study tour begins with a series of general conferences designed to acquaint icipants with the organisation, duties and historical development of the to be visited. Then follows a period of inspection lasting several weeks, during ie participants are frequently divided into small groups in order to allow each to make a minute examination of the health services in particular areas without ng unduly with their normal operation. The final conference is usually Geneva, where each participant reads a paper on some subject to which he has ticular attention, and general discussion takes place. The work of the Health ation in particular, and of the League of Nations in general, is explained to ip before the members disperse.

OF INTERCHANGES OF PUBLIC HEALTH PERSONNEL FROM 1922 TO 1926.

(a) *General Public Health Activities.*

Date of opening	Date of closing	Countries visited	Number of participants	Number of nationalities represented
. 9th, 1922	Dec. 18th, 1922	Belgium, Italy, Poland, Netherlands	21	7
). 24th, 1923	April 12th, 1923	England	29	16
il 14th, 1923	May 15th, 1923	Austria		
t. 23rd, 1923	Dec. 31st, 1923	United States of America	18	16
). 1st, 1924	April 17th, 1924	Great Britain	19	17
il 24th, 1924	May 30th, 1924	Netherlands	24	21
ie 1st, 1924	July 16th, 1924	Denmark		
g. 10th, 1924	Sept. 20th, 1924	Switzerland	20	13
). 9th, 1925	March 28th, 1925	Great Britain	15	13
rch 1st, 1925	Aug. 8th, 1925	Cuba, United States of America		
		Canada, Great Britain		
		Switzerland		
		France, Italy	10	10
y 4th, 1925	June 24th, 1925	Belgium	15	13

Date of opening	Date of closing	Countries visited	Number of participants	Nu nat rep
May 17th, 1925	July 8th, 1925	Kingdom of the Serbs, Croats and Slovenes	16	
Oct. 18th, 1925	Dec. 4th, 1925	Japan, Korea, Manchuria	17	administra territ
Feb. 22nd, 1926	April 1st, 1926	Great Britain (London and surrounding counties)	15	
March 20th, 1926	June 1st, 1926	West Africa	14	
May 27th, 1926	July 3rd, 1926	Denmark	15	
July 10th, 1926	Aug. 25th, 1926	Netherlands, Belgium, France, Switzerland (Combined exchange)	10	

(b) *Special Public Health Activities*,

Date of opening	Date of closing	Countries visited	Number of partici-pants	Number of nationalities represented	Subje studi
May 21st, 1923	June 15th, 1923	Italy	16	11	Malari
Feb. 6th, 1924	May 3rd, 1924	Austria, Feb. 6-17 Czechoslovakia, Feb. 18-22 Hungary, Feb. 23-26 France, Feb. 29 to March 12 Belgium, March 13-21 Great Britain, March 22-April 12 Netherlands, April 13-21 Switzerland, April 22-30	16	13	Tuberc
March 21st, 1924	May 7th, 1924	Great Britain, March 21 to April 11 Belgium, April 14-29 Netherlands, May 1-7	13	12	School Hyg
March 23rd, 1925	May 4th, 1925	Switzerland, Belgium, France, Great Britain, Netherlands	13	12	Industr Hygi

ening	Date of closing	Countries visited	Number of participants	Number of nationalities represented	Subjects studied
n, 1925	Dec. 23rd, 1925	Barcelona, Marseilles, Algiers, Naples, Alexandria, Suez, Port Said, El Tor, Jaffa, Haifa, Piræus, Salonica, Trieste, Venice, Geneva	12	10	Port Hygiene (Mediterranean Ports).
, 1926	July 20th, 1926	Great Britain	17	17	Sanitary Engineering.
n, 1926	Oct. 13th, 1926	Riga, Libau, Danzig, Stettin, Copenhagen, Hamburg, Bremen, Rotterdam, Amsterdam, Antwerp, Dunkirk, Havre, Southampton, London, Liverpool, Geneva.	15	12	Port Hygiene (Baltic and North Sea Ports).

2. Individual Study Tours.

t from the collective study tours, the Health Organisation grants, according edits available, individual scholarships to public health officers whose administ vish them to complete their training or to specialise abroad.

e scholarships are granted for a period of from three weeks to six months, programme of the tour is carefully prepared in advance.

he end of 1926, the Health Organisation had thus granted about fifty ips.

V. SPECIAL ENQUIRIES.

1. Child Welfare.

s sixth session, in September 1925, the Assembly of the League of Nations o request the Health Organisation to investigate infant mortality from the iew of feeding in infancy, and to enquire into the advisability of constituting mmittee which would be able to call upon the co-operation of specialists in ountries in questions concerning child hygiene, and which would be requested e the investigation of those and any other questions connected with child he consideration of which might be deemed expedient. After preliminary s, chiefly statistical, carried out by the Health Section, the Health Committee at its sixth session, from April 26th to May 1st, 1926, to invite German, Austrian, French, Dutch, Italian, Norwegian and United States experts to meet a, at the end of September 1926, to consider the possibility of instituting an

international enquiry in this field. These experts submitted to the Health Co a series of recommendations, which were unanimously adopted at its eighth s October 1926. Extensive enquiries will be made on the following points :

1. Methods of immunisation against infantile infectious such as diphtheria, measles and scarlet fever. The report of the inve will contain a summary of the results obtained in the different coun
2. The methods employed in the different countries to inst general public, especially mothers, as well as the technical personne hygiene of early infancy and childhood.
3. The unification of methods of registration of infant death still differ in the various countries.

The experts will themselves proceed on the spot to comparative invest into infant mortality in the various parts of their respective countries. The will also extend to continents other than Europe.

2. Rabies.

During the last few years, the Health Committee has had before it on occasions proposals urging them to undertake a study, from the international view, of the question of preventive vaccination against rabies. At its sixth sess Health Committee decided, in conformity with these proposals, and on an in from the Pasteur Institute, to convene at that institute in Paris a Confer specialists on rabies and to assemble an international conference on rabies t representatives of the Health Administrations of the entire world would be The agenda of the conference, which will meet on April 25th, 1927, is provi fixed as follows :

1. Nature of the rabic virus.
2. Technical methods of vaccinating bitten persons ; various cations of the Pasteur treatment employed.
3. General and local accidents of anti-rabic treatment ; post-v paralysis.
4. Problems of vaccination of bitten domestic animals and of tive vaccination of the dog.
5. Necessity of compiling uniform statistics of the results obta anti-rabic treatment.
6. Miscellaneous questions (such as that of experiments to t power of immunisation of the different methods of anti-rabic treatme the legislation in force in the several countries).

VI. PUBLICATIONS.

Among the most important publications issued by the Health Section League of Nations Secretariat we may mention :

A. *The Series of Handbooks on Vital Statistics.*

These handbooks give a description of the system of official vital statistics and the history of its development in each country. Details are given of the the registers of population, the registration of births, still-births and death

certification of causes of death and the notification of infectious diseases. cipal forms used are reproduced and the relevant laws and current regulations ussed. A bibliography of the various official statistical reports and the id articles on vital statistics in the several countries is also given.
volumes which have already appeared deal with the following countries :

Austria,	Netherlands,
Belgium,	Portugal,
Czechoslovakia,	Scandinavian Countries,
England and Wales,	Spain.

B. *The Series of Handbooks on the Organisation and Duties of the Public Health Services in the Various Countries.*

se handbooks contain a description of the organisation and working of the ealth services of certain countries and a summary of the historical and c conditions which have influenced their development.
following volumes have appeared :

Australia,	Hungary,
Austria,	Kingdom of the Serbs, Croats and Slovenes,
Czechoslovakia,	Latvia,
Bulgaria,	Netherlands,
French Colonies,	Ukraine.
Germany	

C. *The International Health Year-Book.*

object of this publication, of which the present volume is the second, is to to date the information contained in the handbooks named under B, and to irvey of the progress made in public health during the year under review. In to the reports of the national health administrations, they contain also the of the chief international public health institutions.

s of Handbooks for Public Health Officials taking part in " Interchanges ".

se books, which are edited by experts appointed by the health administrations respective countries for the use of officials delegated to take part in the collec- ly tours made under the auspices of the Health Organisation of the League of contain detailed reports on the different aspects of health conditions in the s to be visited. The following volumes have appeared :

Belgium,	Japan (in English only),
Denmark,	Netherlands.

E.—*Special Researches and Enquiries.*

ler this head are grouped reports on enquiries made at the request of the ients, publications relating to the work of the technical committees set up by lth Committee, the proceedings of the various international conferences and noranda embodying the results of special epidemiological enquiries.

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PREFATORY NOTE.

The Health Section of the Secretariat of the League of Nations presents herewith the volume of a series of handbooks on the vital statistics of various countries. In doing so, it wishes to express its gratitude and thanks for the generous help given by competent authorities, with whom much consultation and correspondence was necessary by the authors of the text.

The Section and the authors are particularly grateful to the officials of the Czechoslovak Statistical Office of Czechoslovakia, who spared no pains to insure the accuracy and completeness of this handbook.

At the invitation of the Health Section, this handbook was prepared by Dr. Major Greenwood and Major P. Granville Edge, of London, England. The Section appreciates the interest and care with which the authors performed their work and wishes to thank them most cordially.

HEALTH SECTION OF THE SECRETARIAT
OF THE LEAGUE OF NATIONS.

Geneva, May 1st, 1927.

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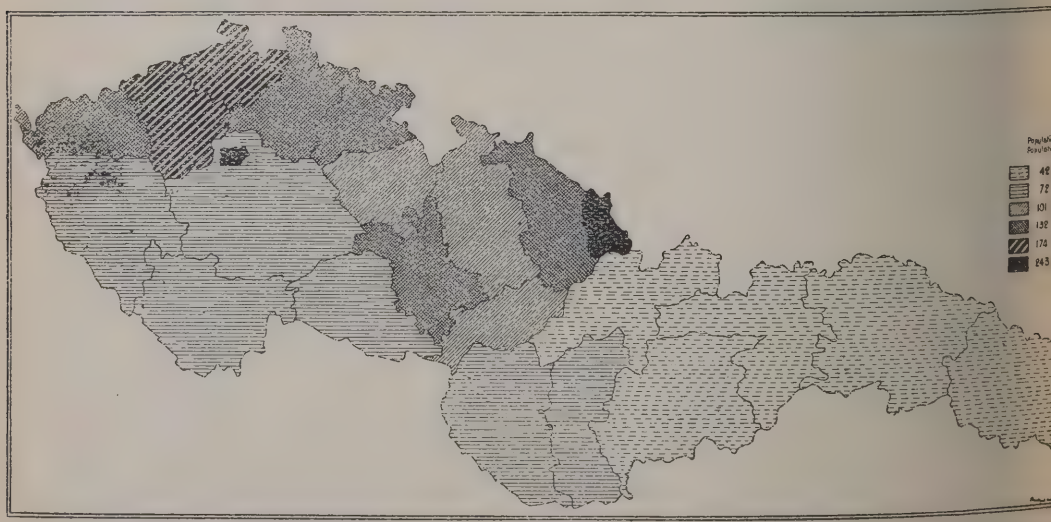

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INTRODUCTION.

need for a ready and reliable source of detailed and descriptive information official vital statistics of the various countries has long been keenly felt by ians and public health officers. The difficulties which are at once encountered ita from two or more countries are assembled for comparative purposes are to all. When the Health Committee of the League of Nations decided to and publish current data on the prevalence of the chief communicable important questions arose concerning the comparability of the data. Sub- y, in organising its programme of statistical work, it was planned as a special to prepare a series of handbooks describing the official vital statistics of the countries.

refore it is the purpose of these volumes to present a review of the existing and procedure in the collection and publication of statistics on population, leaths, and notifiable diseases, including not only methods of registration the current published reports. Effort has been made to include especially cts the knowledge of which is important when comparisons are made of s from two or more countries. The statistics themselves are discussed chiefly ard to the form and contents of the official reports in which they are presented. s realised that, even when meticulous care is exercised in preparing such ks as these, errors may not be entirely avoided, and the ultimate utility ork can be judged best only by actual experience. Nevertheless, it is con- hoped that they will prove useful and valuable as reference books on the f method and procedure in the various national offices which collect and vital statistics.

1. THE REPUBLIC OF CZECHOSLOVAKIA.

Area.

The boundaries of the Republic of Czechoslovakia, as defined by the Treaties with Germany, Austria and Hungary, include Bohemia, Moravia, Sl Silesia and Ruthenia (Carpathian Ruthenia). The total area of the Republic a areas of individual Provinces are as follows:

	Square Kilometres
Bohemia (Čechy)	52,064
Moravia (Morava)	22,315
Silesia (Slezsko)	4,423
Slovakia (Slovensko)	48,936
Carpathian Ruthenia (Podkarpatská Rus.)	12,656
Total area	140,394

Population.

According to the census of February 15th, 1921, the population figures

Bohemia	6,670,582
Moravia	2,662,884
Silesia.	672,268
Slovakia.	3,000,870
Carpathian Ruthenia	606,568
Total	13,613,172

The term "Czechoslovak" comprises two branches of the same Slav n namely, the Czechs of Bohemia, Moravia and Silesia, and the Slovaks of Slo According to the census of 1921, the total population of the Republic was com of the following nationalities:

Czechoslovaks	8,760,937
Germans	3,123,568
Magyars	745,431
Ruthenians	461,849
Poles	75,852
Jews	180,535
Others	25,871
Aliens	238,943
Total	13,612,986

Government.

n October 28th, 1918, the National Council took over the Government of the slovak countries which had formerly belonged to the late Austro-Hungarian chy, and on November 14th of the same year the National Assembly, meeting gue, formally declared the Czechoslovak State to be a Republic. The Consti- of the Republic was approved by the National Assembly on February 29th, he principal terms of the Constitution being as follows:

ıe Czechoslovak State should be a democratic Republic, with an elected ent at its head.

ıe National Parliament should be the only legislative body for the whole lic.

ıe National Parliament should consist of two Houses, viz.:

A Chamber of Deputies, to consist of 300 Members elected by popular vote a term of six years; and

A Senate of 150 Members, elected by popular vote and renewed every eight ars.

principle, both Chambers are equal and Bills may be introduced by either only, in the case of the Budget and Army Bills, these must first pass through amber of Deputies.

ıe two Chambers in joint Congress elect the President for a term of seven Under the Constitution, the President is Head of the State, supreme commander rmed forces, appoints and recalls all Ministers and higher Government officers icials, and can declare war with the consent of Parliament. The Government ses the following Ministries:

Foreign Affairs,
Interior,
Finance,
Commerce,
Public Works,
Food Supplies,
Railways,
Health and Physical Education,
Social Welfare,
Justice,
Agriculture,
Education,
National Defence,
Posts and Telegraphs,
Unification of Laws.

Administrative Divisions and Local Government.

The territory of the Czechoslovak Republic comprises countries having be formerly partly to Austria, *i.e.*, Bohemia, Moravia and Silesia, referred to historical provinces; and partly to Hungary: Slovakia and Carpathian Rutheni

The Austrian and Hungarian territories had different administrative org tions which have remained substantially unchanged.

I. In Bohemia, Moravia and Silesia there exist two administrative systen State and the autonomous Governments, each with its own sphere of compe

1. For purposes of State administration, each province is divided into dis with district administrative offices in the large cities, each having a magistrate head of affairs.

Above these are the provincial government boards, each in the capital respective province, *i.e.*, Prague, Brno and Opava.

Above these again are the State administrative departments, the ministi

2. The smallest units of autonomous administration are the communes, communal corporation at their head. A certain number of communes are asso in the district committee.

The highest authority in the autonomous administration is the prov government committee with headquarters in the capital of each province, P Brno and Opava.

This double system of autonomous and State administration will be unif Bohemia, Moravia and Silesia by the creation of departments (*župy*). An Act t effect has already been passed, but not yet carried out.

II. In Slovakia, the former administrative system with a department a has been reorganised by the Law of January 1st, 1923. Slovakia is divide departments, with a departmental office at the head of each. Each departme several districts, with district offices. The highest administrative authoriti Slovakia are the ministries.

III. In Carpathian Ruthenia, the former division into departments has maintained. At the head of its administration is the civil government offi Užhorod, with a governor at its head.

When the division of the whole Republic into departments has been c out, Carpathian Ruthenia will form one department.

The Development of the Public Health Service and the Present System of Administration.

whole territory of the Republic is divided into sanitary districts, some of ing included in an administrative district where the public health duties ormed by district physicians. A number of communes have communal ns for the same purpose. In larger cities there exist city health boards. a recent time in these districts, communal and municipal physicians rformed their duties as a part of the autonomous administration. Two go, the sanitary police service was nationalised, and the district, com- nd municipal physicians are at the present time State officials on contract. itary police service of the capital Prague, is exempted from nationalisation. each district office there is attached a State medical officer, who is the referee istrict administration in matters of public health.

Provincial Government Board has special health sections, at the head of here is a State medical officer.

blic health questions of general importance are dealt with by the Ministry c Health and Physical Education, which has five sections:

tion 1. — Sanitary police, infectious diseases, supervision over practitioners' , district, communal, municipal physicians, apothecaries, drug stores.

tion 2. — Hospitals, industrial hygiene, water supplies, sanitation, transport grants, health resorts, medical research.

tion 3. — Social hygiene, tuberculosis, venereal diseases, alcoholism, infant

tion 4. — Child hygiene, physical culture.

tion 5. — Legal section.

2. ESTABLISHMENT OF AND RESPONSIBILITY FOR STATIS

General.

Having so recently become a separate entity in the national sense, an therefore only at the commencement of her administrative development, the F of Czechoslovakia has had neither the time nor the opportunity as yet for ac a statistical history of her own. Alive to the importance of national statistics a measure of expediency following the establishment of the Republic, the new (ment adopted the statistical systems and procedures formerly followed in and Hungary. The result was manifested in the two systems of registration f in the country, namely, the Austrian system [1] in the western Provinces of B Moravia and Silesia, and the Hungarian system [1] in the eastern provinces of S and Sub-Carpathian Ruthenia. With these systems were inherited the laws and h of development peculiar to the two countries formerly comprising the Dual Mo Under the old regime, Austria was the dominant State, whose statistical dated back to 1753, and whose Imperial Statistical Bureau had been esta by Royal Decree in the year 1829. It was not until 1871 that a so-called indep statistical bureau was established in Hungary, and not until 1895 that that obtained complete independence in her statistical administration, when she esta civil registration on modern lines.

The State Statistical Council and Bureau.

Shortly after the creation of the Czechoslovak Republic, the statistical was organised by the General Statistical Law of January 28th, 1919. The l introduced a general system and created two services responsible directly President of the Council of Ministers, and independent of the other ministries are: The *State Statistical Council* and the *State Statistical Bureau*, whose comp and powers were detailed in two governmental decrees of November 28th, 1

The State Statistical Council is an advisory body composed of represen of the various ministries, officials of autonomous areas (*e.g.*, Bohemia, Slo Moravia, and Silesia), members representing universities, technical colleges, merce, agriculture, finance and labour. This committee, which acts under the manship of the Director of the State Statistical Bureau, is divided into v sub-committees for the consideration of the statistical treatment of data ob from different sources.

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[1] For further information, see the *Statistical Handbooks* of Austria and of Hungary.

State Statistical Bureau is the executive service of the Republic which
ır the carrying out of the statistical requirements and recommendations
ouncil in so far as national statistics are concerned. The Bureau is organised
sections, covering the whole range of national statistics. Section 2 is the
vith which we are especially concerned, since this section is responsible for
on statistics, births, marriages, deaths, migration, changes in communal
es, etc. A special sub-section deals with the statistics of public health.

The Law of January 28th, 1919.

general duty of supplying information was imposed by the following pro-
f the Law of January 28th, 1919:

cle 5. — All inhabitants of the State except persons enjoying the rights
territoriality must furnish all information and data demanded from them
ate Statistical Bureau, directly or indirectly by other agencies or authorities
ance of the resolutions of the State Statistical Council. Non-compliance
provision is punishable by a fine not exceeding 1,000 Kč.
etition of the same offence, culpable negligence or other aggravating
ances, render the offender liable to imprisonment for a period not exceeding
hs, and to the imposition of a fine, the amount of which varies according
riousness of the case.
over, the State Statistical Bureau is authorised to obtain the information
or indirectly, at the offender's expense.

cle 6. — The provisions of Article 5 apply also to all public local units in the
well as to associations, companies and commercial undertakings of all kinds.
ents are personally responsible for compliance with the statistical duty.

. . . . . .

e law protects the citizens from any abuse of the information supplied for
l purposes in the following circumstances:

cle 7. — The publication of the statistical data shall not reveal individual
onditions. The publication of individual statistical data shall be subject
proval of the State Statistical Council. The unpublished individual statis-
rds shall not be handed over for inspection to any other authority or depart-
rticularly not to the taxation service. The individual statistical returns
be used as bases for the assessment of taxes.
ate compilation of the official statistical material may be permitted under
sions of Article 8 by the President of the State Statistical Council.

cle 8. — No persons by whom statistical data are collected, compiled or
shall disclose any information regarding private conditions to services
n the statistical one. Non-compliance with this duty, as well as any abuse

of information obtained for statistical purposes, is punishable by a fine
prejudice to private rights of civil process for compensation in a court of
not exceeding 10,000 Kč or by imprisonment not exceeding two years.

It has been mentioned that the State Statistical Bureau, which had to s
with considerable initial difficulties, at first took over in the demographic depa
the Austrian methods in the Western Provinces and the Hungarian method
Eastern Provinces, in order to maintain continuity with the past. Reform a
fication of these methods were being effected gradually, so that in 1920 a
of the statistics of divorce and invalid marriages, in 1922 of the statistics of emi
(no such statistics existed in Austria), and in 1924 of those of the natural mo
of the population were carried out. Since January 1st, 1925, uniform ind
birth, death, marriage and identity (legitimation) schedules have been intr
which are transmitted monthly directly to the State Statistical Bureau. The
system of vital registration has been retained, however. These registers hav
maintained by the civil authorities in the eastern provinces since 1894, and
ecclesiastical authorities of recognised religious denominations in the W
Provinces since 1784

3. THE POPULATION IN CZECHOSLOVAKIA; THE CENSUS.

General.

.e Law of January 28th, 1919, not only provided for the establishment of a tatistical office at Prague; certain provisions contained in this law are of t importance in so far as the taking of the census in the Republic is concerned. 5 imposes upon all citizens the obligation of furnishing correctly (under ' for non-compliance) all information which may be required for statistical :s. Articles 7 and 8 announce a general guarantee that, when information d is of an individual or personal character, the strictest secrecy will be observed authorities in dealing with such data.

.e first law adopted by the National Assembly having particular reference to taking in the Republic was that of April 8th, 1920; the terms of this law pro- r the enumeration of the population at intervals of five years, establish the regulations which shall govern the taking of the census, and govern the neces- :dits required for the census. The first census of the Republic of Czechoslovakia ınder the authority of this law was effected on February 15th, 1921.

.e law of March 17th, 1927, provides for the enumeration of the population rvals of ten years, the next Census to be taken in 1931.

Procedure.

ıder the terms of the law we have quoted, the Ministry of Interior is empowered fer upon administrative authorities throughout the country all necessary ty required for the taking of the census within their boundaries. Upon receipt e powers, local authorities proceed to the subdivision of their territories into ient census areas, and to the appointment of census officials at a fixed rate of ·ration. Census agents are appointed in the approximate proportions of one)er 500 to 1,000 inhabitants (according to the area and difficulties attaching locality) and one supervisor per four to eight census agents. Each of these is provided with a Government identity card, which is his authority to visit ter the households within his area in the exercise of necessary census duties. lteen days before the day fixed for the taking of the census, local authorities all concerned within their boundaries, by means of public notices, etc., of the ate of the census, what is required of responsible persons, and what penalties · imprisonment) will follow any failure to comply with the regulations pro- ed. Census agents then proceed to the distribution of family schedules, taking portunity to explain how schedules are to be completed, and warning all)lders of the necessity for furnishing correct replies to the questions contained , and generally recommending their strict compliance with all recommendations ;ulations in force. Printed instructions are also distributed and, in addition, ted schedules containing model answers to questions, to serve to guide all

concerned in the completion of their own papers. The information contained i household bulletin is as follows:

Name and christian name;
Relation to owner of dwelling or head of household; position in hous
(*e.g.*, domestic, lodger, etc.)
Sex;
Civil state;
Day, month and year of birth;
Place of birth (commune, district, country);
Date of taking up residence in commune;
Registered residence or citizenship;
Nationality (mother-tongue)[1];
Religion;
Whether able to read and write;
Occupation or profession; where employed; position held in occupati
Occupation and position in occupation previous to the war (on July
1914).

Following the census date, agents commence their duty of collecting compl schedules, verifying all entries made and, where necessary, correcting them, first receiving the permission of the person concerned. The agent prepares a sumn of all the schedules collected, arranging the names of localities in alphabetical o This summary is handed to a supervisor, who checks the results so received by ta random samples for verification, after which summaries and completed sched are forwarded to the administrative authorities of the district, by whom a sumn of results for the whole administrative area is prepared, and forwarded to the S Statistical Office at Prague. Little time is lost by the employment of this me of procedure, as may be gathered from the fact that, following the census of Febr 15th, 1921, the preliminary results were published in July of the same year.

After publication of the preliminary results of the census, the State Statis Office engages upon a detailed tabulation and calculation of statistical average sums, tabulation being effected by means of mechanical aids.

This final presentation of the results of the census was divided into three p of which two have already been published in the Czech, French and German langua

Part 1 contains data of sex, nationality according to mother-tongue, citizens denomination, age and marital condition, increase or decrease of population an density.

Part 2 contains data of the occupation and position in occupation of the p lation in Bohemia (Section 1), Moravia and Silesia (Section 2), Slovakia and Carpathian Ruthenia (Section 3); they are combined also with the sex, nationa according to mother-tongue, citizenship, denomination, age and marital condit

[1] See Annex: 8. Nationality.
[2] Independent and tenants, officials, workmen, apprentices, journeymen, members of fa aiding in occupation.

l of Part 2 summarises these data on the occupation and position in occu-
ır the whole Republic and adds data on the change of occupation since
ı, 1914.

3 will contain data of the ownership of dwellings, of institutions, of popu-
place of origin, duration of their stay in the commune, registered residence,
acy, with distinction of sex and nationality according to mother-tongue.

Official Publications containing Statistical Data relating to the Population.

iew of the fact that the official statistical publications of the Republic of
ıvakia have reference only to conditions prevailing in post-war years, it
ecessary for the investigator who wishes to make comparisons extending
ime, and prior to the establishment of the Republic, to have recourse to the
l publications of both Austria and Hungary, since the Republic of Czecho-
comprises Provinces which formerly were a part of these countries.
his end, we refer the reader to *The Official Vital Statistics of the Republic*
a and to *The Official Vital Statistics of Hungary*, of the "Statistical Hand-
ries" published by the Health Section of the League of Nations. The
art of the information relating to present Czechoslovak territory contained
ficial publications of Austria and of Hungary presenting the census results
ill now be found in the second part of the volume *Manuel Statistique de la*
ie Tchécoslovaque, Vol. II (see page 23). For the former Kingdom of
the data relating to pre-war years are contained in the reference book of the
tical Office of Bohemia in Prague.

ry Results of the Census of 1921 (Résultats préliminaires du recensement
ı population du 15 février 1921) [1].
volume is a summary and survey of the census figures of 1921 and contains
ving information:
ase in the population per cent in each province for the periods 1869-80,
1891-1900, 1901-10.
l population in each department and province; number of occupied houses;
f communes in each province and density of population per square kilometre.
population in each department and province according to the census
1910 and 1921; increases or decreases, absolute figures and percentages.
ity of population in each province at each census date 1869-1921.
lation in districts with a Czech majority compared with the population
:s with a German majority.
ber of districts in each province having the following densities of population
: kilometre:

0–40	80–100	150–200	Over 500
40–60	100–120	200–300	
60–80	120–150	300–500	

[1] běžné výsledky sčítání lidu z 15. února 1921.
äufige Ergebnisse der Volkszählung vom 15. Februar 1921.

Decennial increase or decrease of population 1881-1910, as affected by movement of the population and by migration.

Number of communes in each department and province having populat

0– 2,000	10,001– 20,000	Over 100,000
2,001– 5,000	20,001– 50,000	
5,001–10,000	50,001–100,000	

and numbers of residents per 100 houses in such communes, 1921.

Population of cities having 100,000 to 500,000, 100,000 to 50,000 and to 20,000 for 1910 and 1921.

Population of each province and district, and of communes having mo 2,000 inhabitants, and further indicating:

Numbers of houses and residents in 1921;
Population (persons), 1910 and 1921;
Increase or decrease of population.

Charts of:

Increase or decrease of population, 1910-21;
Density of population in the Republic, 1921;
Movement of population in provinces, 1910-21;
Migrations and losses (of population) due to the war, 1911-21.

The Results of the Census in the Czechoslovak Republic of February 15th, 1921. Vo Prague 1924. (*Recensement de la population dans la République Tchécos le 15 février* 1921, Vol. 1, Prague 1924. Volume 9 of "La Statistique slovaque")[1].

The larger part of the work includes tables with data of:

1. Number of communes, villages, houses inhabited and uninhabited, and present inhabitants by sex for each district, department and province communes with over 10,000 inhabitants.

2. Increase or decrease of population as a result of natural mo emigration and war losses; density of population for each district, dep and province.

3. Czechoslovak citizens tabulated according to mother-tongue:

Czechoslovaks,	Poles,
Russians,	Serb-Croat-Slovene,
Germans,	Roumanians,
Magyars,	Gipsies,
Jews,	and other nationalities,

[1] Sčítání lidu v republice československé se dne 15. února 1921. I. díl. Volkszählung in der Čechoslovakischen Republic vom 15. Februar 1921. Band I.

ıe total of foreigners in each district, department and commune with over inhabitants, also as compared with 1910.

Foreigners tabulated by the following countries of origin:

Austria,
Germany,
Poland,
Great Britain and Ireland,
Union of Socialist Soviet Republics,
Bulgaria,
Italy,
Switzerland,
France,
Roumania,
Hungary,
Kingdom of the Serbs, Croats and Slovenes,
Other European States,
United States of America,
Other American States,
Other parts of the world,

ı district, department and province. For the several provinces "Other European" are classified as citizens of:

Belgium,
Holland,
Denmark,
Norway,
Sweden,
Spain,
Portugal,
Greece,
Finland,
Other European States.

reigners tabulated according to mother-tongue for each district, department ovince in classes as under No. 3 and also for the several provinces in the cal part of the volume put under the heading "Other nationalities" contain lowing nationalities:

rb-Croat-Slovene,
lian,
ench,
umanian,
lgarian,
English and American,
Danish, Norwegian,
Swedish,
Gipsies,
Lithuanian,
Dutch,
Spanish and Portuguese,
Armenian,
Greek,
Other nationalities and Unknown.

The present population, including foreigners according to mother-tongue ', for each department and province.

The present population by religious denominations:

Roman Catholic,
Greek and Armenian Catholic,
Evangelical by nine denominations,
Greek and East Armenian,
Old Catholic,
Czechoslovak,
Israelites,
Others,
Persons professing no religious cult,

ı district, department and province, and for the different communes with ,000 population. For departments and provinces also by sex.

7. Number of communes, houses, tenants and inhabitants by 8 gro agglomeration, *i.e.*, communes with a population:

Under 500	5,001–10,000
From 501–1,000	10,001–20,000
1,001–2,000	20,001–50,000
2,001–5,000	Above 50,000

for each district, department and province.

8. The present population, including foreigners, by size of commune by 8 of agglomeration as under No. 7, and by nationality and religion for each depar and province.

9. The present population, including foreigners, by ages, sex and marita dition (unmarried, married, widowed, divorced) for each department and pro

10. The present population by age-groups:

0– 4	40–59
5–14	60–79
15–24	80 and over,
25–39	

for each district, department and province.

11. The present population by characteristic age-groups:

(*a*) School-children in ages of 6 to 13 years;
(*b*) Persons aged 21 years and over;
(*c*) Males and females aged 14 years and over;
(*d*) Women in the ages of 14 to 44 years;
(*e*) Men liable (*i*) to military service in ages of 20 to 50 years; (*ii*) to s services in war in ages of 17 to 60 years; (*iii*) to drafts in a 20 to 22 years,

for each district, department and province.

12. The nationalities by five-year age-groups, sex and marital conditi each province.

13. The present population by marital condition and sex for each di department and province and for communities with over 10,000 population.

The text contains an analysis of the data given in the tables an corresponding rates. The introductory chapter quotes the law and governi ordinance on the taking of the census, all schedules requisite to it, and the m

: compilation is described. There are 14 charts indicating by districts the ıg information: sex; number of persons according to mother-tongue; foreigners; ; persons professing no religious cult. Six other charts indicate for each :e the population by age-groups.

ısus in the Czechoslovak Republic of February 15th, 1921. Volume II, Parts 1-4; ıgue, 1925 and 1926. (*Recensement de la population dans la République Tchéco-vaque le 15 février* 1925 *et* 1926. Vol. 20-23 of "La Statistique Tchécoslovaque")[1]

rts 1, 2 and 3 contain separately for each province — Bohemia in Part 1, a and Silesia in Part 2, Slovakia and Carpathian Ruthenia in Part 3 — owing data:

Occupation[2] and position in occupation:

(*a*) Occupations: Independents,
Tenants,
Officials,
Workmen,
Apprentices,
Journeymen,
Members of family aiding in occupation;
(*b*) Persons without occupation of their own;
(*c*) Domestics.

8 classes, also by sex and 34 groups of occupation, for each circuit, adminis- districts of the respective chambers of commerce, and department, and ı datum by 247 minor groups of occupation.

Composition of the present population by 6 social groups: independent, officials, workmen, apprentices, journeymen; by relation to occupation, by ; and 34 groups of occupation and by sex for each department and province; ı province also combination with the ethnical nationality and citizenship gion.

The present population by 8 classes and 34 occupational groups and position ıation, divided by 14 age-groups, marital condition, and sex for each province.

Data of occupation and social classes, only the more important occupations ı nationality, including foreigners for some more important towns and of mixed nationalities.

t 4 contains in the table section data as under Nos. 1 to 4 for the whole c, moreover, the following data:

—

[1] tání lidu v republice Československé ze dne 15. února 1921. II díl. Část 1. 2. 3. 4. lkszählung in der Čechoslovakischen Republik vom 15. Februar 1921. Band II., 1, 2, 3, 4.

[2] classification of occupation in Czechoslovakia is occupational, *i.e.* a brewery car driver t be allocated to the chemical group (brewers) but to that of *transport*.

5. Changes in occupation and position held in occupation as compare July 1914, by sex, 8 classes and 34 groups of occupation and by 4 categories of p in occupation for each province:

Independent and tenants,
Officials,
Workmen, apprentices, journeymen,
Members of family aiding in an occupation.

6. Changes of occupation which have taken place since 1914, by s position in 8 classes and 34 groups of occupation, in combination with 8 class 34 groups of former occupation for each province.

7. Data under Nos. 5 and 6 are compiled for the whole country accor mother-tongue, *e.g.:*

Czechoslovak,
Russian,
Polish,
German,
Magyar,
Jewish.
Other Foreigners.

The text contains an analysis of the data of the occupation of the popu with numerous retrospective tables and rates; it includes also 4 charts showi spread of the different occupations.

The Statistical Manual of the Czechoslovak Republic (Vol. 2, Prague, 1925). (*I Statistique de la République Tchécoslovaque*, Vol. II, Prague, 1925)[1], co

Part I. — In Chapters XIII and XIV, in 54 tables, the most important of the census taken in 1921.

1. Area in square kilometres, number of communes, houses inhabited an habited, tenants, households, and population by sex, and according to mother-t

Czechoslovak,
Russian,
German,
Magyar,
Polish,
Serbs, Croats or Slovenes,
Roumanian,
Jewish,
Other.

for each department and province.

2. Number and density of population at the census of 1921, compare the results of the censuses during 1869–1911, for each Province.

3. Nationality of the Czechoslovak citizens, as enumerated under N communes with populations:

Under 500
From 501–1,000
„ 1,001–2,000
„ 2,001–5,000
From 5,001–10,000
„ 10,001–20,000
„ 20,001–50,000
Over 50,000

for each province.

[1] Statistická příručka republiky Československé, II. Praha 1925.
Statistiches Handbuch der Čechoslovakischen Republik, II. Prag 1925.

The religion of the population:

Roman Catholic,	Czechoslovak,
Greek and Armenian Catholic,	Israelite,
Evangelical of all denominations,	Others and Unknown,
Greek and Armenian Orthodox,	Without denomination,
Old Catholic,	

ination with population groups, in classes as under No. 3, for each pro-

Foreigners by country of their origin and according to mother-tongue province.

Area in square kilometres, number of population by:

Czechoslovak,	German,
Russian,	Magyar,
Polish,	Jewish nationalities,

circuit and administrative district in each province.

Area in square kilometres, population by sex, according to mother-tongue zenship, by religion for each community with over 10,000 population.

Population by years of age, five-yearly groups and by sex for each province.

Population by five-yearly groups in combination with nationality and marital n and sex for the whole country, the same for each province without combina- h nationality.

Population by characteristic age-groups for each department and province.

Literacy (knowledge of reading and writing) of persons over 6 years for ovince.

The most important results of the census of lodgings taken in 1921 in Prague.

Occupation of population in 1921 and 1910 by 8 classes of occupation (for lso by 34 groups of occupation), by sex, position held in the occupation, province and for the whole country.

Population by position in 8 classes of occupation by sex for each province.

Occupation of population by 247 kinds of occupation and position held pation by sex, for Bohemia, Moravia and Silesia.

Development of each of the 8 classes of occupation by position in the occu- in the years 1890-1921 in Bohemia, Moravia and Silesia.

Comparison of occupation in 8 classes and 34 groups and its social position ears 1910-1921 by sex in Bohemia, Moravia and Silesia.

18. Occupation of population in 1921 by 8 classes and 34 groups of occu in combination with the nationality:

Czechoslovak,
German (in Silesia also Polish), and
Others,

in 8 classes of occupation, also in combination with religion and by social po in Bohemia, Moravia and Silesia.

Part II (retrospective). — Contains the following data for the territory Czechoslovak Republic according to the census in 1910 or according to older cen

For the territory of the Czechoslovak Republic in her extent on February 2nd, 19

1. Area in square kilometres, number of communes, houses, population and religion, foreigners, civilian and military population, density, for each depar and province.

2. Area in square kilometres, the present population, percentage of nationality, religion and percentage of foreigners for each district, departmen province.

3. Number of the present population in 1880, 1890, 1900 and 1910 for larger commune (with over 5,000 inhabitants in 1910), for each province, also of 1869.

4. The present population by sex and marital condition by each departmen province.

5. Population by age:

Under 6 years	From 20–39 years
From 6–11 years	„ 40–59 „
„ 12–14 „	Over 60 years
„ 15–19 „	

for each province.

6. Population by 4 or 8 classes of occupation in 1910 in each departmen province.

For Bohemia, Moravia and Silesia in their historical extent:

1. Number of population and its density since 1818 to 1910 and estim population for each year between 1869 and 1913.

2. Proportion of sexes, 1830-1910.

3. Number of communes, houses and households, 1869-1910.

Languages spoken (Czech, German, Polish and other), 1880-1910, and religion
n-Catholic, Augsburg Confession, Evangelical Confession, Reformed Evangelical
ion, Old Catholic, Israelite, others professing no recognised religious cult),
)10.

Population by languages spoken and foreigners (sexes separate) in 1910.

Marital condition (sexes separate) in 11 age-groups, 1869-1910, for 1910
ed also by language spoken.

Population by civil state and age, quinquennial groups, 1910.

Population in decennial age-groups (for each town of over 20,000 popula-
nd each province; tabulated also by language spoken, in 1910.

Population in characteristic age-groups (see paragraph 11 on page 21) and
1890, 1900 and 1910.

Literacy in 1890, 1900 and 1910; for 1910 also by age-groups (8).

Number of houses, householders and population in 1890, 1900, 1910 by
nes having a certain population (see page 23, Part I, paragraph 3).

Households tabulated by number of persons and children, sex, marital
n, language spoken, head of household and his occupation (4 classes)[1] in 1910.

Results of the housing census of the larger towns in 1910.

Population by 4 classes,[1] 31 main groups and 173 minor groups of occu-
by sex, sex proportion and social classes, in 1910.

Population by each of the 4 classes of occupation,[1] by social class, age,
e spoken and religion, in 1910.

vakia and Carpathian Ruthenia in their extent, 1921:

De facto population in the years 1869 to 1910 by departments (comitats).

De facto population in 1910 by sex and marital condition, mother-tongue,
in ages:

Under 6	20–39
From 6–11	40–59
12–14	Over 60
15–19	Age unknown,

comitat (department).

—

[1] Agriculture and forestry.
Industry and mining.
Commerce and transportation.
Public services (military and civil), independent persons, and persons unemployed.

3. Number of dwelling-houses for each comitat in 1910.

4. Number of civilian and military population by mother-tongue in and 1910 for each town.

5. Population in 10 occupation-groups for each comitat in 1910.

6. Agricultural and industrial population by sex and position in occup nationality of the industrial workers for each comitat in 1910.

For the 23 former Upper-Hungarian municipalities, which, either in whole part, are situated in the territory of Slovakia and Carpathian Ruthenia.

1. Area in square kilometres, number of population, its density and perc of increase in the years 1890, 1900, 1910, by sex, nationality and marital co for each department and municipality.

2. Sex ratio in the years 1880-1910 for each municipality.

3. Number of districts, towns and communes, number of population b marital condition, 12 age-groups, knowledge of languages (among Slovaks), li for each department and municipality.

4. Population by years of age and sex for the total of Slovakian depar and municipalities and Ruthenian departments and municipalities.

5. Distribution of each nationality and religion in each decade, 1880 to for each department and municipality.

6. Tables containing the following data for 1910 for both territories state, age (8 groups), sex, mother-tongue, religion.

7. Tables containing the following data for 1910 for both territories: Ag and mother-tongue. Age, sex and religion.

8 Dwelling-houses by kind of building material and dwelling conditions for each municipality.

9. Population by 10 classes of occupation and relation to occupatio supporting, supported) in the years 1890 to 1910 for each municipality.

10. Occupation of the population, tabulating 300 different occupations main occupational groups.

11. Tables containing data relating to 11 occupational groups for 1 the whole Republic, tabulated to indicate:

Sex and age *,
Civil state,
Social condition,
Mother-tongue,
Religion.

---

* (0-19; 20-39; 40-59; 60 and over; age unknown).

Persons engaged in public services and the liberal professions tabulated by ther-tongue and religion for the whole territory in 1910.

of the State Statistical Bureau of the Czechoslovak Republic (Rapports de l'Office Statistique de la République Tchécoslovaque).

ese reports have furnished in different issues the following data obtained e census of 1921:

The present population by sex, nationality according to mother-tongue, nip, religion, sex ratio, nationality and density of population in 1910 and 1921 district, department and province (for the year 1922: Nos. 5, 9, 12, 13, nd 34).

Sex ratio by nationality and religion for each province; division of population nationality and religion into urban and rural population (7 groups) in each e; foreigners by ethnological and political nationality for each department vince (year 1923, No. 26).

Population by sex, five-yearly groups and marital condition for each pro- or the whole country also by nationality (year 1923, No. 39).

Occupation and position in occupation in 8 classes and 47 groups for each e, occupation also in comparison with 1910 (for Bohemia, Moravia and Silesia h 1890, 1900); occupation by 8 classes of occupation and 13 main groups of for each administrative district, of the respective chambers of commerce department and province in Bohemia, Moravia and Silesia, also for each ith over 10,000 inhabitants (year 1923, Nos. 3, 15; year 1924, Nos. 26, 41-42; 25, No. 35).

Occupation by 8 classes and 34 groups and position in occupation by 8 classes bination with nationality and religion (year 1924, Nos. 70-71; year 1925, -52).

Czechoslovak citizens and foreigners tabulated by nationality and religion province (year 1925, No. 14).

these publications are issued in the Czech or Slovak, German and French es.

pital of Prague: A Demographic Study, by Dr. Antonín Boháč (Prague, 1923).[1]

is study contains a comprehensive summary of the results of the census of 1921 capital of the Republic, with a special view to its historical development. h summary of 20 pages is attached to this book, which is published in Czech; the 100 pages of tables and 16 charts the titles are printed in Czech and in

[1] Hlavní město Praha. Studie o obyvatelstvu. Napsal Dr Boháč, Praha 1923.

The Statistical Lexicon of Communes in the Czechoslovak Republic (Stati Gemeindelexikon der Tschechoslowakischen Republik). Part I, Bohemia; I Moravia and Silesia; Part III, Slovakia and Carpathian Ruthenia (1924-26).[1]

This work contains the following results of the census of 1921:

1. Area in hectares, number of houses, tenants, population by sex and e nationality:

Czechoslovak,	Polish (in Silesia),
German,	Magyar (in Slovakia and Carpathian
Jewish,	Ruthenia),
Other,	Russian,

and religion:

Roman Catholic: In Eastern Slovakia and Carpathian Rutheni Greek Catholic,

Evangelical: In Eastern Slovakia and Carpathian Ruthenia, also d into Augsburg Evangelical and Reformed Evangelical,

Czechoslovak: Only in the Western Provinces,
Israelite,
Others,
Without denomination,

and the number of foreigners for each commune, circuit, administrative d department and province.

2. Development of nationality and religion (in classes as under No. 1 1880 to 1921 (in the Eastern Provinces from 1890 to 1921) in each circuit, admi tive district, department and province.

3. Institutions and military garrisons, with number of population b nationality and religion.

4. Number of villages, communes, boroughs and towns in each district, ment and province.

Statistisches Handbuch des Königreiches Böhmen (published by the Statistical B Prague, Bohemia).

Population of each district, with distinction as to sex, religion and la spoken.

Total population over a series of years (available since 1827), with disti as to sex, proportion of women per 1,000 men.

[1] Statistický lexikon obcí v republice Československé 1921.

al population in each district, with distinction as to civil state, also tabulated llowing age-groups: 0–14 years; 15–60 years and over 60.

al population in each district according to place of abode, birthplace, d to indicate:

Persons born in the same commune in the district,
Persons born elsewhere in the same district,
Persons born in another district in Bohemia,
Persons born in another State in the Empire,
Foreign born.

for each district:

Numbers born in another district;
Numbers born in Prague and Vienna, with distinction as to sex.

4. REGISTRATION IN CZECHOSLOVAKIA.

General.

The histories of development and the racial characteristics of the peo the Eastern and the Western Provinces of the Czechoslovak Republic being pletely different, the authorities, on the establishment of the Republic in 1919, to adopt as a temporary measure of expediency the systems of registration to and practised in each of those areas, until such time as a national and system could be formulated and introduced.

From 1919 to 1924, then, the old Austrian system of registration was the *Western Provinces* (Bohemia, Moravia, Silesia). Under this system, regi duties relating to persons of acknowledged religious cults were performed clergy, while such duties appertaining to persons of no recognised denom were carried out by the civil authorities. During the same period, the system tration introduced in Hungary in 1894 was followed in the *Eastern Provinces* (Sl Carpathian Ruthenia), and under this procedure the registers were mai by State registrars.

The principal differences marking these systems, in so far as the Czech Republic is concerned, are briefly commented upon in the following pages, fuller particulars the reader is referred to the "Statistical Handbooks" pu by the Health Section of the League of Nations, where these systems are de in detail, viz., *The Official Vital Statistics of the Republic of Austria* and *The Vital Statistics of Hungary.*

5. REGISTRATION OF LIVE BIRTHS.

(a) *In the Western Provinces*, 1919-24.

gistration of live births was compulsory under the Austrian Law of 1857; gious communities were held responsible for the maintenance of the registers s of children of parents of professed religion, the religious communities being:

Roman Catholic,
Greek Catholic,
Old Catholic,
Orthodox Greek,
Augsburg Evangelical Confession,
Swiss Evangelical Confession,
Israelite.

e births of children of parents of no acknowledged religious cult were registered political authority of the district. There was no regulation governing the period for registration of births to the ecclesiastical authorities, but births which be declared to the political authority had to be notified within eight days of h. The information required for entry in the birth register was as follows:

Serial number,
Day, month and year of birth,
Place of birth,
Sex of child,
Legitimacy,
Whether live birth or still-birth,
Occupation of father (or of mother if illegitimate),
Date of birth of parents,
Date of marriage of parents,
Nature of obstetric assistance (if any).

) *In the Eastern Provinces* (Slovakia, Carpathian Ruthenia), 1919-1924.

or to the establishment of civil registration in Hungary in 1894, registration cted by the clergy. In 1894, however, Hungary was enabled to attempt the ion and development of her own statistical system, and under the Law XXXIII, nended by Law XXXVI, 1904, a complete reorganisation, largely based upon

the Swiss system of registration, was introduced, these laws providing for, case of births:

State registers of births,
Individual cards for each record of birth,
Notification of a birth within seven days,
Maintenance of registers by State registrars,
Despatch of completed records each month.

The information required for the registration of live births in areas fo within the Hungarian zone was as follows:

Form A. (green colour).

Registration
(paris

Birth Card

(used in Eastern Provinces 1919-1924)

1. Current number in the register of births.....
2. Date of birth, day ....., month....., year.....
3. Name and surname of child.....
4. Sex .....
5. Religion.....
6. Live born or still-born .....
7. Legitimate or illegitimate.....
8. If illegitimate, whether acknowledged by father .....

   If illegitimate, particulars of mother only.

   Father ..... Mother .....

   (*a*) Occupation.....

   (*b*) Religion .....

   (*c*) Age in completed years.....

   (*d*) Mother-tongue .....
9. Place of birth.....
10. Single or multiple birth .....
11. Remarks: foundling, born in a public institution, etc.

s understood that, in so far as births among acknowledged religious communi- concerned, very few ultimately escape registration, since the ceremony of serves as some guarantee in the case of the Christian population of the country. more, under the Law of September 10th, 1897, midwives are required to the priest with particulars of all births attended by them and with all parti- necessary for inscription in the birth register. In addition, midwives are l to keep an accurate record of all births attended by them and forward a weekly return to the political authority on cards provided for this purpose. these is illustrated below.

Form B.

Weekly Return.

me of Midwife ..... living at No.....
eet ....., notifies ..... live births and
..... still-births from Sunday the ..... 19....., to Saturday the ..... 19.....

Name and surname of parents	Occupation (for illegitimate children, of the mother only)	Residence	Date of birth	Sex		Child was	
				Male	Female	Live-born	Still-born

Note. — All children born during the week shall be entered on this card, and lwives must then transmit these cards each Sunday to the City Medical Officer, Rural Medical Officer of their district, during his office hours. Midwives are uired, under Article 31 of their Service Regulations (Decree of the Ministry of Interior, September 10th, 1897, No. 216), to ensure that every birth attended by m is reported within eight days after the confinement, so that such births may entered in the registers of births.

o births have been attended by midwives during the period covered by the eport, then a nil return must be rendered.

Form A.
Return.

Weekly Statement of Births.

lwife.....
dress.....
ring the week from Sunday, the..... to Saturday, the ..... 19.....,
had attended no birth or miscarriage.

.....
Midwife.

In addition to these notifications, the midwife must forward every six m an exact copy of her records for that period to the District Medical Office information contained in these half-yearly reports being as follows:

On the cover of the schedule:

Political District..... Name of midwife .....

Commune ..... Address of midwife .....

SUMMARY OF BIRTHS

for the ..... six months of 19.....

List No. .....

Inside the schedule is the following information:

SUMMARY OF BIRTHS.

Current number	Residence	Name and surname	Year of birth	Civil state	Occupation	Religion	Date and hour of arrival of midwife	Hour, day, month and year of birth	Number of previous confinements	Sex and name of child	Months of pregnancy	Position of delivery of child at birth	Whether born alive, apparently dead, or dead	Development of child at birth	Any deformities	Any accidents during birth dangerous to life or fatal	Nature of obstetric aid	Date and hour of expulsion of placenta	Diseases (if any) of the mother during the puerperium. In the case of death Indicate the date	Diseases (if any) of the child during the puerperium. In the case of death state the cause	Special remarks
1	Of the mother 2a	2b	2c	2d	2e	2f	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

lowing the receipt of these returns, the District Medical Officers are required ile Summary Tables similar to the following:

Summary of Births.

piled from the Returns of Midwives for the ..... six months of 19.....

Number of Communes:	
Number of Midwives:	(*a*) Licensed,
	(*b*) Transmitting returns.
Number of Births:	(*a*) Recorded by midwives,
	(*b*) From Public Records.
Births:	(*a*) Primogenial,
	(*b*) Other,
	(*c*) Single,
	(*d*) Twin,
	(*e*) Multiple.
Sex at Birth:	(*a*) Males,
	(*b*) Females,
	(*c*) Sex not determined.
Confinement:	(*a*) At term,
	(*b*) Premature (8th to 10th month),
	(*c*) Miscarriage (before 5th month).
Position of fœtus.	

e returns are used by the political authority as a means of verifying the ntained in the local parish registers and serve as a check upon accuracy. As step towards the verification of all entries made each year, each parish priest vard to his superior ecclesiastical authority and to the district political a certified copy of all entries contained in the register maintained by

onsibility for declaration of a birth under the Austrian law was imposed upon the father of the child or, in his absence or default, upon the doctor or ttending the mother, or upon any relative or person resident in the household he birth took place. Under the Decree of September 13th, 1888, medical ers are required to submit to the local authority a weekly return of all which they have assisted during the previous week — for the purposes of the word "birth" to include both live births and still-births.

Form B.

Name and Address of Registration Office .....
Political District.....

List of Births during the ..... Quarter of the Year 19.....

Commune .....
Political District...

1 Current number in register of births	2 Day and month of birth	3 Place where birth took place	4 Sex	5 Legitimacy	6 Livebirth or still-birth	7 Occupation of father (or of mother if illegitimate)	8 Whether any obstetric aid at birth	9 Date and year of birth of parents	10 Date of marriage of parents	11 Gener remar

The district authority verifies these returns by reference to the weekly received from midwives and doctors (see above), and, after verification, f these returns to the Provincial Government in special envelopes and on a summary form containing the following particulars:

Form E. **MOVEMENT OF POPULATION**

DURING THE ..... QUARTER OF THE YEAR 19...

Name and Address of Registration Office (Parish).....
Political District.....

Political District to which particulars re .....

Current Number	Communes to which particulars refer	NUMBER OF						Remarl
		Marriages	Births			Deaths		
			Total	Still-births	Legitimate	Total	Not residents of the commune	
1	2	3	4	5	6	7	8	9

(c) *Uniform System Since 1925.*

January 1st, 1925, a uniform system of births registration was introduced ɔut the Republic and the following forms adopted :

(This form is printed on *blue* paper).

Central Statistical Office, Prague.

Form B. (blue colour).

tion Office (Parish) .....

Current number.....

Year.....

Individual Birth Card.

1 Serial number in the birth register.....
2 Surname and christian names .....
3 Date of birth (day, month, year).....
4 Birthplace: commune, district, province .....
5 Sex (male or female) .....
6 Legitimacy (legitimate or illegitimate).....
7 Vitality (born alive or still-born).....
(By a still-born child is meant a child which after birth has shown no signs of life, pulse, respiration. Fœtuses (embryos) born before 28 weeks of pregnancy are not counted as still-births.)
8 Who attended the birth (physician or midwife)?.....
9 Religion of the child.....
10 Date of marriage of parents (day, month, year).....

	Father, legitimate or illegitimate	Mother
11 Date of birth (day, month, year)	.....	.....
12 Marital condition — (only in case of illegitimate children).....	.....	.....
13 Residence: commune	.....	.....
district	.....	.....
province	.....	.....
14 Citizenship	.....	.....
15 Mother-tongue	.....	.....
16 Religion	.....	.....
17 Occupation	.....	.....
18 Position in occupation	.....	.....

19 In the case of an illegitimate child, whose mother is without occupation, state the occupation and position in occupation of her father or guardian. .....
20 Number of children issue of the same mother.. .....
21 Number of children who have died .....
22 Number of children issue of the present marriage.....
23 Date of birth of the preceding child (day, month, year).....
24 Indication whether a single birth, twins or multiple birth .....
25 In the case of an illegitimate child, state whether the mother has cohabited with the putative father of the child .....
26 The place of confinement, whether at home, maternity home, or other institute .....

Note. — See p. 3, 5 and 11 of the instruction [1]

At..... the..... 19.....

.....

Signature of Registrar

[1] See Annex.

Transmission of Data.

(a) *In the Western Provinces 1919-1924.*

Every three months a copy was made of all inscriptions entered in the birth r during the previous quarter in the form of a list, one copy of which was sent district authority and one to the ecclesiastical authority of that district. returns were made upon official schedules specially provided for the purpose.

From such returns, the political authority was able to compile statistics f province, after which all returns were forwarded to the Central Statistical Bure the compilation of the national statistics.

(b) *In the Eastern Provinces 1919-1924.*

Completed individual cards of births were despatched on the eighth day o month direct to the Central Statistical Bureau in official envelopes specially pr for the purpose. No single envelope might contain more than 150 cards and births have occurred during the month, the registrar was still required to forwa return. The documents used in this connection contained the following inform

Province ..... District .....

Registration Office .....

Included are:

Type A. Certificates of Birth.
Type B. Certificates of Marriage.
Type C. Certificates of Death.
Type D. Medical Certificates.

Stationery required.

Type A. .....
Type B. .....
Type C. .....
Type D. .....

Envelopes for Central Statistical Bureau .....

Envelope for use of Physician:

To the State Office of Statistics,

PRAGUE

Official Matter
Post Free

rns of Births and Deaths from the larger Towns.

addition to the two systems of transmission of data mentioned above, it is y to call attention to the following additional requirements.

ler the Austrian Decrees of the Ministry of the Interior of March 13th, 1885, uary 10th, 1896, weekly reports of births were introduced for towns having ition over 10,000 inhabitants, the following information being required in such

ince ..... District .....

WEEKLY RETURN OF BIRTHS AND DEATHS [1]

for the period ..... to .....

Births	For the week			For preceding week		
	Male	Female	Total	Male	Female	Total
e births ...						
l-births						

[1] Columns for deaths not reproduced here.

these returns were applicable to only a very limited number of towns, their tion and despatch was not strictly enforced, and therefore the statistics of ces did not possess a very high degree of accuracy. Statistics compiled from ns received were published at quarterly intervals in the *Oesterreichisches vesen.*

lowing the creation of the Republic of Czechoslovakia, a Presidential Decree 30th, 1923, slightly amended the requirements discussed above and, as a nal measure, required fortnightly returns of births (and deaths) according to wing plan:

itical District..... Year .... Month .....

ovince .....

RETURN OF BIRTHS AND DEATHS.

Births		Native Mothers		Foreign Mothers		Total		Births in Institutions	
		M.	F.	M.	F.	M.	F.	M.	F.
e births.	Legitimate								
	Illegitimate								
l-births .	Legitimate								
	Illegitimate								
al	Legitimate								
	Illegitimate								

From these half-monthly returns, monthly statistics are compiled indic

Total births for each district;
Total live births and still-births for each district;
Total live births and still-births, with distinction as to legitimac sex for each district;
Total births, with distinction as to sex and legitimacy for each d and tabulated according to residence of the mother.

Note. — The half-monthly returns transmitted by the larger towns were d tinued under the terms of the Ordinance of the Prime Minister, July 30th, 1925. the introduction of a uniform system for the transmission of data returns all areas were received at the Central Statistical Bureau without delay.

(d) *Present System used in the whole Territory of the Republic.*

Further reforms were introduced, and on January 1st, 1925, the proc was standardised throughout the Republic. The registrar (whether ecclesia or civil) sends the completed individual birth cards for the preceding m before the 5th of each month to the Central Statistical Bureau in an official env especially furnished for this purpose. It will be observed that the schedule also as an official stationery requisition form for the supply of stationery for reg tion purposes.

The front cover of the envelope contains the following information:

District ..... Registration (Parish) Office .....
Included :
Type A, from No. ..... to ..... total ..... pieces
Type B, from No. ..... to ..... total ..... pieces
Type C, from No. ..... to ..... total ..... pieces
Type D, from No. ..... to ..... total ..... pieces

Grand total ..... pieces

Required supply stationery:

Type A .....
Type B .....
Type C .....
Type D .....
Envelopes .....

To the State Statistical Bureau
(Section II)
in Prague (Smichov)

Official matter, postage free.

here is no registration during the month, an empty envelope is transmitted Central Statistical Bureau.

CIAL PUBLICATIONS CONTAINING INFORMATION REGARDING LIVE BIRTHS.

of the State Statistical Bureau of the Czechoslovak Republic (Rapports de l'Office Statistique de la République Tchécoslovaque). Issued by the State Statistical reau in Prague[1].

· the years 1919-20 only the most important data, *i.e.*, the number of live or quarterly periods, for 1919 by departments and provinces (1921, No. 3, o. 7), 1920-22 also by circuits (in the Western Provinces) and by administra-:ricts (in the Eastern Provinces).

· 1923 and 1924, data of live births by month of birth, sex and legitimacy department and province (year 1924, Nos. 28, 68; year 1925, Nos. 11, 15,

ce 1925, data for each month relating to live births by sex, legitimacy and s ethnical nationality:

Czechoslovak,	Polish,
Russian,	Jewish,
German,	Other nationalities,
Magyar,	

province. To these data is added the daily average in comparison with the ceding months (year 1925, Nos. 42-44, 46, 50, 53, etc.). Data of sex and cy are published at quarterly intervals only in a German edition, *ngen* (year 1925, Nos. 102, 117, etc.).

ıddition to this general information, since 1923 data on live births (by month sex, legitimacy, mother's residence), as well as on confinements in institutions, g published for each city with over 10,000 inhabitants (year 1924, Nos. 49-50, 1925, Nos. 9, 25, 32). Since 1925, they are published in full in the *Mitteilungen stischen Staatsamtes* only (year 1925, Nos. 112, 122, etc.).

Statistique de la République Tchécoslovaque (Vol. II, Prague 1925*).*

s manual contains in Chapter XV data of:

nber of live births in the years 1919 to 1923 for each province;

h rate and natural increase for 1919-23 for each province in comparison data for 1901-1910;

ality and natural increase in the years between 1901 and 1923 for each

[1] ávy státního úřadu statistického. Řada D.

The Natural Movement of Population in the Czechoslovak Republic in the Year and 1920 *(Mouvement naturel de la population dans la République Tchécosl* en 1919 *et* 1920*).*

This publication, containing a detailed compilation of birth and mo statistics, is being printed and will appear in 1928.

The data of births and deaths in the territory of the Czechoslovak Re for the pre-war period are contained in the official statistical publications of A (for the Western Provinces) and of Hungary (for the Eastern Provinces), ar described in the publications entitled *The Vital Statistics of the Republic of A* and *The Vital Statistics of Hungary.*

6. THE REGISTRATION OF STILL-BIRTHS.

(a) *Definition of "Still-birth".*

e regulations governing the registration of live births in the Western and Provinces of Czechoslovakia, described in preceding pages, are applicable the registration of still-births in the Republic. It should be remembered, r, that in Old Austria (and therefore in the Western Provinces of the Republic) n "still-birth" carried with it an entirely different significance from the rm used in Hungarian territory (or in the Eastern Provinces). For example:

Old Austria, still-births were births of children, who, being born dead, had a stage of development which indicated the possibility of independent e. Non-viable children were regarded as abortions or miscarriages, and, as eir registration was not required.

Old Hungary, still-births were children born after the seventh month of gesnd without signs of life, or children who died before or during birth. Children ive, and living for any time, however short, were deemed live-born.

gal Definition of "Still-birth" at the Present Day. The definitions above were until the end of 1924. On January 1st, 1925, a *uniform definition* of "still- was prescribed in the following terms:

> "A still-born child is a child which, since the *moment of birth*, has shown no signs of life (pulse, respiration, etc.). Embryos born before the end of the 26th week of pregnancy are not considered as still-born children."

(b) *Official Publications containing Information regarding Still-births.*

pports de l'Office de Statistique de la République Tchécoslovaque, Prague ; *Statistique de la République Tchécoslovaque*, Vol. II (Prague 1925).

e data of still-births are published in the same places as the data of the ths and in the same classes. The list of official Czechoslovak publications births as given on page 40 and 41 is, at the same time, a list of such publican still-births.

7. THE REGISTRATION OF DEATHS.

(a) *Systems followed from* 1919 *to* 1924.

As in the registration of births, the registration of deaths in the Wester vinces was governed by the Austrian regulations, while in the Eastern Pro the Hungarian regulations remained in force.

In the Western Provinces (Bohemia, Moravia, Silesia). — The registration of was compulsory, the registers being maintained by the clergy of the different rel denominations, or by the civil authority in the case of those deaths occurring a persons belonging to no denomination or to a creed not acknowledged by the No time-limit was imposed within which declaration of a death must be made, e in the case of deaths among those of a creed not recognised by the State, declaration to the civil authority was required within eight days aft occurrence of death.

The law imposed the responsibility of declaration upon the surviving hu or wife, or, in absence or default of these, upon the nearest surviving relati upon all persons living in the household in which death occurred, while dea institutions, etc., were notifiable by the head of such institution.

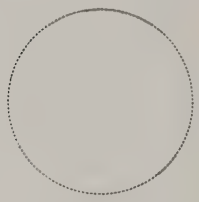
In the Eastern Provinces (Slovakia, Carpathian Ruthenia). — Civil reg were maintained and deaths recorded by State registrars. Deaths were noti within two days after the occurrence of death, or on the next working day foll that on which death took place.

Responsibility for declaration was imposed upon the nearest surviving rel upon the physician who attended the deceased during his last illness, and all members of the household in which the death took place. For each death no the registrar completed an individual death card in the following form:

Registration District

Individual Death Card.

(Used in the Eastern Provinces, 1919-24.)



. Current number in Register of Deaths .....
. Name and surname of deceased.....
. Religion.....
. Mother-tongue .....
. Occupation .....
. Age..... 7. Sex. .....
. Civil state (single, married, unmarried or divorced) .....
. If deceased was dependent upon others or, in case of the death of a married woman, give occupation of bread-winner .....
. If married:
(*a*) Date of marriage .....
(*b*) Number of children, issue of the marriage, including still-born children ..... and number of children still living .....
(*c*) Age of surviving partner.....
. Place and time of death:
Locality .....
..... Day ..... Month ..... 19.....
. Diagnosis of cause of death made by:
(*a*) Physician .....
(*b*) Layman. .....
. Cause of death .....
. Whether treated during last illness by physician .....
Name and address of treating physician.....
.....
. Remarks (indicating whether found dead, died in hospital or other institution, and, if the latter, whether a resident or stranger in the locality) .....
.....

(b) *Uniform System introduced in* 1925.

uniform system for the registration of deaths was introduced throughout the ic on January 1st, 1925. Under the regulations prescribed at that date, tion of the occurrence of a death must be made within two days, or on the orking day following the day on which the death occurred.

sponsibility for declaration is imposed upon the nearest surviving relative deceased, upon the physician attending deceased during his last illness, and l members of the household in which the death took place. For each death , the registrar completes an individual bulletin in the following form, these es being uniform throughout the Republic since January 1st, 1925, and ding the different schedules formerly used in the Western and the Eastern es respectively.

STATE STATISTICAL BUREAU,
PRAGUE.

Form I

Serial number of the death card .....
Name and address of the registration office (parish) .....
Year .....

Individual Death Card.

1. Serial number in the death register .....
2. Date of death (day, month, year) .....
3. Place of death: local commune ..... district .....
province .....
4. Name (christian and surname) of the deceased .....
5. Sex (male or female) .....
6. Civil state (single, married, widowed, legally separated or divorced) .....
7. Date of birth (day, month, year) .....
8. Place of birth: local commune ..... district .....
province .....
9. Last residence: local commune ..... district .....
province .....
10. Citizenship .....
11. Nationality .....
12. Religious denomination .....
13. Occupation .....
14. Position in occupation .....
15. Primary cause .....
16. Complications, concomitant diseases, etc. .....
17. Immediate cause of death .....
18. Whether contagious or occupational disease .....
19. Kind of violent death (suicide, accident, homicide) .....
20. Name of attending physician .....
21. Was the cause of death ascertained by a physician? .....
22. In the case of children 0-1 year, state whether breast-fed, bottle-fed, etc. .....
23. In the case of children under 10 years: whether legitimate or illegitimate .....
24. In the case of children and persons without occupation: occupation and position in occupation of parent or guardian .....
25. In the case of women: (*a*) number of all children (live and still-births) .....
(*b*) Number alive .....
26. Whether death occurred at home, at a hospital, sanatorium, lunatic asylum, etc

At (place) ..... on (date) ..... 19.....

Signature of the communal, municipal or district physician:

.....

Note. — Questions 15-22 must be copied exactly from the death certificate

The Certification of Causes of Death.

ems applied from 1919 *to* 1924.

or to the introduction of a uniform system on January 1st, 1925, important es marked the methods followed in the Western and Eastern Provinces rely. For a detailed description of these the reader is advised to refer to the cal Handbooks " of (a) *Austria* and (b) *Hungary*, published by the Health of the League of Nations. Very briefly summarised, the existing differences follows:

The Western Provinces, certification of *cause* could be effected by a medical ner or by a non-medical verifier of deaths.

medical certificate contained primary cause, secondary cause, and actual

ial nomenclature used for the classification of causes of death comprised s.

The Eastern Provinces, certification of cause of death could be effected by a practitioner or by a non-medical verifier of deaths.

medical certificate contained "Cause of death as diagnosed by the physician."

ial nomenclatures were two in number: (*i*) for use by non-medical verifiers (27 causes); (*ii*) for use by medical practitioners (180 causes).

System introduced in 1925.

hough to the end of the year 1924, an official medical certificate was required ig the cause of death, and without it no burial permit could be issued registration authority, the methods employed in the completion of such tes differed in the Western and Eastern Provinces. Under the provisions ecrees of the Czechoslovak Ministry of Public Health of April 11th and July 25, a uniform certificate of death was introduced, and its use was applic- the whole of the Republic. This was further amended under the terms of isterial Decree of April 7th, 1926, a copy of this amended form being ed (Form E, No. 433) hereafter.

medical officer whose duty it is to certify the cause of death completes the te, and hands it to the person or persons concerned in order that registration effected and a burial permit obtained. The certificate of death may be by the registrar during the act of registration of the death. Under special ances, a layman may be appointed as a post-mortem examiner of the dead but in such cases the death certificate completed by him is submitted fficial physician for inspection and signature. The certificate introduced in s in the following form:

Form E.
(abolished in 1926.)

Commune ..... Post-mortem Examiner .....

Certificate of Death.

1. Date of death (day, month, year).....
2. Place where death occurred (commune, street, house number, circuit, administrative district, provin
.....
3. Name (surname, christian names) of deceased.....
4. Sex.....
5. Date of birth.....
14. Day and hour of burial.....
15. Reason for verification of death by layman (if such has taken place); special sanitary measur
other remarks .....

In ..... on the ..... of (month) ..... 19...

Signature of Mayor ....
Signature of the communal (municipal)
or district physician.

Note. — In case of a still-birth, this should be indicated under heading 1 with a statement of t approximate age of fœtus; under heading 3, name and surname of parents; for illegitimate still-birt mother's name and annotation "illegitimate"; under heading 5, also hour of birth; under heading 1 the name of midwife or physician attending the birth.

The inside contains the following information:

6. The immediate cause of death .....
7. Complications, concomitant diseases, etc.....
8. Direct cause of death.....
9. Whether a contagious or occupational disease.....
10. Kind of violent death (suicide, accident, homicide).....
11. Name of physician treating the deceased.....
12. Was the cause of death ascertained by a physician ?.....
13. If a child under one year of age: breast, artificial, or mixed feeding ? .....
.....
16. Remarks of the post-mortem examiner.....

The above form was abolished and replaced by the following in 1926:

Form E. No. 433.
(1926)

Commune..... *Official charged with the duty of verification of death* .....

Certificate of Death.

1. Certificate number in the Death Register.....
2. Date of death (day, month, year).....
3. Place of death: (commune, street, No.) ..... district ..... province .....
4. Name and christian names of the deceased.....
5. Sex ..... 6. Civil status (single, married, widower widow, divorced).....
7. Date of birth (day, month, year).....
8. Place of birth: commune..... district ..... province .....
9. Last address: commune ..... district ..... province .....
10. Commune of origin ..... district ..... province .....
11. Nationality..... 12. Religion.....
13. Occupation.....
14. Position in occupation .....
15. Primary cause.....
16. Complications, concomitant diseases, etc.....
.....
17. Immediate cause of death.....
18. Whether contagious disease or occupational disease.....
19. Nature of violent death (suicide, accident, homicide).....
20. Name of attendant physician.....
21. Was the cause of death certified by a medical practitioner ?.....
22. For children aged 0-1 years, state whether breast-, bottle-fed, etc. .....
.....
23. For children 0-10 years, whether legitimate or illegitimate .....
.....
24. For children and persons having no occupation, occupation and position in occupation of parer or guardian.....
25. In case of woman: (*a*) total number of children (born alive and still-born).....
(*b*) number of children still living .....
26. Did death occur at the home of the deceased, in a hospital, sanatorium, asylum, etc. ? .....
.....
27. Date and hour of burial.....
28. When verification has been made by a layman, state reason for this action, special sanitary measur taken and any other remarks .....
.....
.....

At ....., the ..... day of ..... 19...

Signature of the Mayor..... Signature of the communal, municipal or district medical officer

.....

al Nomenclature since 1925.

e January 1st, 1925, the International List of Causes of Death (1920 revision) adopted for statistical purposes in the classification of causes of death; the official publications of the Republic contain particulars of causes of death l according to a short list of 58 causes, as follows:

nber of the ational List of Diseases.	Causes of Death.
1	2
1	Typhoid and paratyphoid fever.
2	Typhus fever.
5	Malaria.
6	Smallpox.
7	Measles.
8	Scarlet fever.
9	Whooping-cough.
10	Diphtheria.
11	Influenza with complications.
, 4, 12-16	Relapsing fever, Malta fever, or miliary fever, mumps, Asiatic cholera and cholera nostras, dysentery.
21	Erysipelas
23	Lethargic encephalitis.
24	Meningococcus meningitis.
26–28	Glanders, anthrax, rabies.
31	Tuberculosis of the respiratory system.
32–37	Other forms of tuberculosis.
38	Syphilis.
25, 29, 30, 40, 42	Other endemic epidemics and infectious diseases.
3 and 49	Cancer and other malignant tumours.
57	Diabetes mellitus.
0-56, 58	Benign tumours (tumours of the female genital organs excepted), rheumatism, osteoarthritis, gout, scurvy, pellagra, beri-beri, rachitis, anæmia chlorosis.
59–63	Diseases of the pituitary gland, exophthalmic goitre, diseases of the parathyroid glands, diseases of the thymus gland, of the suprarenals.
64–65	Diseases of the spleen, leucæmia, Hodgkin's disease.
66	Alcoholism.
67–69	Other general diseases.
71	Meningitis.
72, 75*b*	Tabes dorsalis and paralysis without specified cause (of 56).
74	Cerebral hæmorrhage.
75*a*, 75, 76–81	Other cerebral diseases and diseases of the spinal cord.
82–86	Other diseases of the sensitive organs.

(Continuation.)

Number of the International List of Diseases.	Causes of Death.
1	2
87–90	Pericarditis, endocarditis, myocarditis (acute), angina p and other diseases of the heart.
91–96	Other diseases of the circulatory system.
99	Bronchitis.
100, 101	Pneumonia.
97, 98, 102–107	Other diseases of the respiratory system.
111–112	Ulcer of the stomach and of the duodenum and other dise the stomach (cancer excepted).
113	Diarrhœa and enteritis (under 2 years).
122	Cirrhosis of the liver.
108-110, 114-121, 123-127	Other diseases of the digestive system.
128, 129	Nephritis.
130–136	Other diseases of the urogenital system (non-venereal).
137–142	Benign tumours of the ovary and uterus, and other diseases female genital organs and non-puerperal diseases.
146	Puerperal septicæmia.
143–145, 147–150	Other puerperal diseases.
151–155	Diseases of the skin or of the cellular tissue.
156–158	Diseases of the bones and of the organs of locomotion.
159	Congenital malformation (still-birth excepted).
160*b*, 161	Congenital debility, premature birth, or consequences o for the child.
160*a*, 162, 163	Other diseases peculiar to early infancy.
164	Old age.
165–174	Suicides.
175–182	Poisonings (except poisonings of blood and chronic poiso burns and scalding, suffocation or drowning.
183-189	Traumatisms.
190	Wounds of war.
192	Deaths caused by malnutrition or starvation (deprivation or water).
197–200	Homicide and murder.
191, 193-196, 201-203	Other external causes.
204–205	Sudden death, unspecified or ill-defined diseases.

Transmission of Data.

m 1919 *to* 1924.

e systems followed during this period have already been referred to on pages 37-
fly they were as follows:

the Western Provinces, transmission of records at *quarterly* intervals.

the Eastern Provinces, transmission of records at *monthly* intervals.

form System introduced in 1925.

uniform method was introduced on January 1st, 1925, under which each
tion area, whether civil or ecclesiastical, forwards, on the 8th day of each
all individual death cards completed during the previous month (*i.e.*, from the
of one month to the night of the 7th day in the following month). These
smitted direct to the Central Statistical Bureau, in special official envelopes
l for the purpose. One of these envelopes is reproduced on page 37 of the
volume.

cial Publications containing Information regarding Mortality.

s de l'Office de Statistique de la République Tchécoslovaque (published by the
te Statistical Office in Prague) 1919-1927.

se contain for 1919-22 only the most important data, *i.e.*, the number of
y quarterly periods; for 1919, only by departments and provinces (year 1921,
ear 1923, No. 7); for 1920-22, also by circuits (judicial districts) in the Western
es; by administrative districts in the Eastern Provinces (year 1922, No. 59;
3, No. 7; year 1923, No. 38 and No. 69).
1923 and 1924, data of deaths by month for each department and province;
h of death, sex and age in groups of:

0– 1 year	25–39 years
1– 4 years	40–59 „
5–14 „	60–79 „
15–24 „	80 and over

province; by month of death, sex and cause of death according to the Inter-
Nosologic Classification of Bertillon of 1920 (reduced to 58 items) for each
(year 1921, Nos. 28, 68; year 1925, Nos. 1, 11, 15, 45, 48).

Since 1925, monthly data on deaths by sex, age in groups:

0– 1 month	0– 1 year	15–24 years
1– 2 months	1– 4 years	25–39 „
3– 5 „	5– 9 „	40–59 „
6–11 „	10–14 „	60–79 „
		80 and over

of the nationalities (Czechoslovak, Russian, Magyar, Polish, Jewish, other) a Bertillon's International List (as above) for each province. Added is the mortality rate in comparison with the three preceding months (year 1925, 42-44, 46, 50, 53).

Moreover, since 1923, data of deaths for towns with over 10,000 inhabitan published by sex, age, cause of death (shortened list of Bertillon) and on d in institutions (year 1924, Nos. 49-50, 69; year 1925, Nos. 9, 25, 32). Since they are published in full extent only in the *Mitteilungen des statistischen Staats* (year 1925, Nos. 112, 122, etc.).

The Natural Movement of the Population in the Czechoslovak Republic in the Years and 1920 *(Mouvement naturel de la population dans la République Tchécosl en* 1919 *et* 1920).

This book, containing a detailed statistical compilation of deaths and birt in print and will appear in 1927.

The data of deaths in the territory of the Czechoslovak Republic in pr times are contained in the official statistical publications of Austria (for the W Provinces) and of Hungary (for the Eastern Provinces), and are described i handbooks *The Vital Statistics of the Republic of Austria* and *The Vital Statis Hungary*.

8. INFECTIOUS DISEASES.

Notifiable Diseases.

er the old Austrian Law No. 67 of April 14th, 1913, the under-mentioned were notifiable in the provinces of Bohemia, Moravia and Silesia, both before ir (for some time) their inclusion within the boundaries of the Republic of ovakia:

Scarlet fever,
Diphtheria,
Typhoid fever,
Dysentery,
Cerebro-spinal meningitis,
Puerperal fever,
Typhus fever,
Smallpox,
Asiatic cholera,
Plague,
Relapsing fever,
Leprosy,
Trachoma,
Yellow fever,
Anthrax,
Glanders,
Rabies.

917, malaria was added to the above list, while in 1919, after the Revolution, pox and influenza were made notifiable diseases for the whole Republic. ddition, the city of Prague required the notification of all cases of:

Tuberculosis,
Erysipelas,
Measles,
Whooping-cough and
Mumps.

he Eastern Provinces, on the other hand, to which, before the establishment epublic, the Hungarian laws applied, compulsory notification of the following was required:

Plague,
Diphtheria,
Scarlet fever,
Measles,
Whooping-cough,
Smallpox,
Typhoid fever,
Typhus fever,
Dysentery,
Asiatic cholera
Cholera nostras,
Cerebro-spinal meningitis,
Mumps,
Trachoma,
Puerperal fever.

ler the Republic, efforts have been made to unify these lists, and evolve one ch shall be observed throughout the territory.

Procedure of Notification.

sicians, midwives, nurses, heads of households and all persons who become ed with the presence of a case or suspected case of infectious disease are held ble for notification to the competent authorities, namely, to the mayor of the e *without delay*. Cases or suspected cases of scarlet fever, diphtheria, cholera,

plague, smallpox, typhus and rabies must be notified immediately by tel telephone or by special messenger. Notification by physicians is made upon p postcards provided for the purpose; these cards contain the following inform

Parish ..... District .....
Name of patient .....
Address .....
Age .....
Name of disease .....
Date of onset (day, month, year) .....
Signature of physician .....

A Register of Infectious Diseases Notified is maintained by the civil aut in which particulars of all notifications received must be inscribed, namely:

1. Current number .....
2. Date of receipt of notification .....
3. Name of disease .....
4. Address of patient .....
5. Name and surname of patient .....
6. Age of patient .....
7. Occupation (in case of children, occupation of parents) .....
8. Attending school (patient, or members of same household) .....
9. Date of onset of disease .....
10. Date of recovery .....
11. Date of death .....
12. Conveyed to hospital (date and name of hospital) .....
13. Remarks .....

Answers to Items 10, 11 and 12 are inserted from the final notification cert which follows recovery or death of a patient who has suffered from any not disease.

Disinfection.

A number of the larger communes possess either fixed or mobile disin steam apparatus; certain of the smaller communes make use of formalin disin machines. In addition to the above equipment in local areas, the State sa administration has at its disposal three mobile motor-car steam disinfecting ma these are used in emergency in areas threatened by epidemic outbreak, in i cases of infection, and, when necessary, to supplement the existing disin services in local areas.

Bacteriological Examinations.

majority of the bacteriological examinations of specimens submitted by alth authorities are carried out at one or other of the State Bacteriological , of which there are twelve in the Czechoslovak Republic, situated as follows: Bohemia, three in Moravia, one in Silesia, three in Slovakia, and one in Sub- ian Ruthenia. Such services are free.

addition, and supplementing the national services mentioned above, bacterio- examinations are also carried out in the laboratories of certain of the ties.

e State Institute of Hygiene, created under the provisions of the Law of 12th, 1925, will shortly be able to undertake similar work in the interests ic health.

Transmission of Data.

ery two weeks the communal authorities are required to forward to the authority a summary of all notifications of infectious disease received by them. trict authorities in their turn prepare fuller summaries from the returns l by them, and these are submitted through the provincial authorities to the nent of Public Health of the Republic, the schedules used in these processes s follows:

A. — Communal Return.

mmune ..... Date ..... 19.....

strict .....

Half-Monthly Summary of Notified Cases of Infectious Disease

for the Period ..... to ..... 19.....

rrent number .....

ldress of patient .....

ame and surname .....

ge ..... Occupation.....

mber of Cases included from former period of ..... to .....

ew Cases .....

ecoveries .....

eaths .....

emarks .....

B. — District Return.

Province ..... Date .....

Half-Monthly Summary of Notified Cases of Infectious Disease

for the Period ..... to ..... 19.....

District	Commune	Scarlet fever		Diphtheria		and other columns for	Remarks
		New cases	Deaths	New cases	Deaths	Typhoid fever Dysentery Cerebro -spinal Meningitis Puerperal fever Typhus fever Smallpox Cholera Trachoma	

The data from these returns are used in the compilation of monthly stat tables by the Department of Public Health, and their subsequent publicati the official Monthly Bulletin, while the same data are the source from whic Federal Statistical Bureau is able to prepare the annual national statistics of infe diseases.

Official Publications containing Information relating to Infectio Diseases.

A. *Austrian Official Publications containing Information relating to Infectious Di in the Western Provinces of Czechoslovakia (Bohemia, Moravia, Silesia)*

Öesterreichisches Statistisches Handbuch.

Numbers of weekly cases of principal infectious diseases notified amon civilian population only.

Statistik des Sanitätswesens (Health Statistics) (figures available since 1876). Pub by the Central Statistical Bureau.

Numbers of sick persons treated in public and private hospitals and institu in each province and district, indicating numbers discharged cured, not cured, with distinction as to sex.

Public and private hospitals, etc., in each province, numbers of persons in discharged cured, or died, and according to nature of disease.

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[1] Under " Remarks " include other infectious diseases not in this list.
[2] For the period when these Provinces were part of the former Austro-Hungarian Mon

ches Handbuch des Königreiches Böhmen.

nbers of cases of acute infectious disease, and numbers of deaths annually eries of years, the diseases being: Diphtheria, whooping-cough, smallpox, fever, measles, typhus fever, dysentery, cholera, puerperal fever.

garian Official Publications containing Information relating to Infectious eases in the Eastern Area of Czechoslovakia (Slovakia, Carpathian Ruthenia) [1].

e Statistique Hongrois.

nbers of cases of trachoma, numbers of communes affected.

nbers of cases treated at the Pasteur Institute at Budapest for hydrophobia, nbers of deaths, with distinction as to sex; total cases and deaths annually ries of years (no sex).

ches Jahrbuch.

nbers of cases of infectious diseases and names of communes affected, total on of such communes, tabulated to show "Cases", "Cured", "Died", the being: Measles, smallpox, scarlet fever, diphtheria, croup, dysentery, typhus, g-cough, cholera. A summary of total cases of infectious disease is given for a series of years.

che Statistische Monatshefte.

nbers of deaths from infectious diseases in communes and municipalities he month under review, the diseases being smallpox, measles, scarlet fever, fever, diphtheria, typhoid fever, dysentery, tuberculosis, influenza.

al deaths assigned to the above diseases, tabulated for each quarterly period wo preceding years.

lications of the Czechoslovak Republic.

ministerstva veřejného zdravotnictví a tělesné výchovy (Bulletin du Ministère a santé publique et de l'éducation physique), 1919-1926.

nbers of cases and deaths for each Province and District, by month. A ummary of cases and deaths of infectious diseases.

mensuel du Bureau de statistique de la ville de Prague, 1925-1927.

nbers of cases and deaths from infectious diseases in various districts of

né nemoci v Československé rep. (Notifiable infectious diseases in the Czechoslovak ublic), 1920-1924 [2].

nbers of cases and deaths from notifiable infectious diseases by month, Pro- nd Districts. Morbidity, mortality and fatality rates.

---

r the period when these Provinces were part of the former Austro-Hungarian- /.

rávy stát. úřadu statistického N° 140, 1925.

9. SOME OBSERVATIONS
ON
POPULATION STATISTICS IN CZECHOSLOVAKIA.

by Dr. Antonín Boháč, Ph.D., State Statistical Office, Prague.

The study of the statistics of population of the Czechoslovak Republic is mended because of the great variety of the economic, social, cultural, lin racial and national conditions. The differences prevailing among the several and provinces of which this country consist are greater than in any other Eu State. We may point here to the most important ones.

(*a*) The western part of the Czechoslovak Republic (Bohemia, Morav Silesia) is inhabited by people of a high degree of civilisation ranking in this with the most civilised nations of Europe. Persons unable to read or write are non-existent in these provinces, whereas in Slovakia and Carpathian Ru there are still many illiterates, especially in the eastern mountainous di The last census gives the following rates of illiteracy per 100 persons over 5 ye

	Per cent
Bohemia	2.44
Moravia	3.14
Silesia	3.68
Slovakia	15.03
Carpathian Ruthenia	50.16
Czechoslovak Republic as a whole	7.39

(*b*) The economic conditions of Slovakia and Carpathian Ruthenia are st primitive. Agriculture is the chief pursuit; industry is still in a rudimentary manufacturing and trade in the cities are, in both provinces, in the hands o The economic situation of the western provinces (Bohemia, Moravia and is highly developed, their industrialisation has made great progress, so Bohemia and Silesia more inhabitants are engaged in industry than in agri

relative importance of the main occupations in the several provinces is as

	Agriculture, forestry and fisheries %	Manufacturing and mechanical industries %	Trade and transport %	Other occupations %
Bohemia	29.69	40.99	12.50	16.82
Moravia	38.64	34.97	10.27	16.12
Silesia	21.88	50.76	10.49	16.87
Slovakia	60.61	17.67	7.69	14.03
Carpathian Ruthenia	67.71	10.57	7.13	14.59
Czechoslovak Republic	39.57	33.80	10.66	15.97

The more highly developed economic conditions of the western part of the lovak Republic result in a greater density of population. Certain of the ial regions of Northern Bohemia and Silesia rank with the most thickly popuuntries of Europe, while in a great part of Carpathian Ruthenia the popuis not more than 30 per square kilometre. In general, the population per kilometre is as follows:

Bohemia	128
Moravia	119
Silesia	152
Slovakia	61
Ruthenia	48
Czechoslovak Republic as a whole	97

There is also a larger growth of cities in the western part of the Republic. ia and Moravia have relatively twice as much population living in cities as ia and Carpathian Ruthenia. Parishes having more than 10,000 inhabitants the following percentage of the whole population settled therein:

	Per cent
Bohemia	22.26
Moravia	21.87
Silesia	15.88
Slovakia	11.06
Carpathian Ruthenia	11.07
Czechoslovak Republic as a whole	18.90

(*e*) The racial differences are very distinct although the population settled i the present boundaries is the result of the crossing of several races. As a d racial element, there is in the Czechoslovak Republic a minority of Jews who con an important proportion of the population, especially in the eastern regions country, while, in Bohemia and Moravia, they are decreasing rapidly. The number in Bohemia only 1.19 per cent, in Moravia 1.43 per cent, in Silesia 1. cent, in Slovakia 4.53 per cent and in Carpathian Ruthenia 15.39 per cent. I vakia, there is also a considerable number of gypsies.

(*f*) The linguistic and national differences are far more important. The C slovaks constitute 65.51 per cent of the whole population; 3.45 per cent of the lation belong to the Carpathian branch of the Russians who united wit Czechoslovaks to form an independent State. There is in Czechoslovakia a minority of Germans (23.36 per cent), a small number of Magyars (5.57 per a few Jews (1.35 per cent), a scattering of Poles (0.57 per cent) and a few is Roumanians (0.10 per cent). The several provinces show the following na structure:

Bohemia . .	66.64 %	Czechoslovaks,	33.04 %	Germans.	
Moravia .	78.29 %	»	20.93 %	»	
Silesia . . .	47.56 %	»	40.53 %	» and	11.24 % Poles
Slovakia . .	68.07 %	»	21.54 %	Magyars,	4.73 % Germa
					2.89 % Russia
Ruthenia .	3.45 %	»	62.17 %	Russians,	17.35 % Magya
			13.35 %	Jews and	2.33 % Rouma

These nationalities show great differences, not only in respect to the deg their cultural development, but also in respect of their economic and social situ Among Czechoslovaks, agriculture and industry are about equally represe Poles and Germans are employed more in industry than in agriculture, Ru and Magyars are purely agricultural, while among the Jews trade and manufact preponderate.

(*g*) The religious situation is also very varied. The majority of the popu (76.29 per cent) is constituted by Roman Catholics. The Greek Catholics are Ru and Slovaks constituting only 3.93 per cent, Russian orthodox 0.54 per Protestants of various denominations 7.27 per cent, adherents of the Czechos Church 3.86 per cent, Jews 2.60 per cent, and without religion 5.32 per cent.

This variety of religious belief influences the whole structure of the popula and its *natural movement*. It is only necessary to give a few illustrations.

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[1] According to the last census taken as of February 15th, 1921, there were in the whole 13,613,172 inhabitants, distributed as shown below. Owing to the war the increase, in parison with 1910, was not more than 17,854:

in Bohemia	6,670,582, *i.e.*	111,381	less than in 1910
in Moravia	2,662,884, *i.e.*	29,857	more than in 1910
in Silesia	672,268, *i.e.*	15,826	,, ,, ,, ,,
in Slovakia	3,000,870, *i.e.*	74,046	,, ,, ,, ,,
in Carpathian Ruthenia	606,568, *i.e.*	9,506	,, ,, ,, ,,

(1) The Slavonic population and, accordingly, also Czechoslovaks, marry lier and in relatively higher proportion than the Germans and the Russians . Slovaks marry earlier than Czechs. The percentage of marriages between 20 . 25 years of age is as follows:

	Males per cent	Females per cent
Bohemia	10.27	25.12
Moravia	10.07	23.76
Silesia.	14.25	30.82
Slovakia.	25.01	51.25
Carpathian Ruthenia	27.47	58.32

(2) The general decrease of the birth rate which is characteristic of the civi-d nations of Western, Northern and Central Europe during the last few ades manifested itself strongly only in the western portions of the Czecho-vak Republic. This decrease was, greater in Bohemia than in Moravia and sia. It started in the beginning of the 'nineties of the past century and tinued to increase year by year. During the years 1881-85 the annual rate ive births per 1,000 of the population was 38.31, in 1905 it was only 30.82 and nediately before the war, in 1913, it fell to 25.8. After the war the natality tinued to decrease. Slovakia was affected only slightly and Carpathian Ru-nia, where the birth rate is relatively twice as great as in Bohemia, not at all.

During the period 1919-1926 the annual rate of live births per 1,000 of population was as follows:

	Bohemia	Moravia	Silesia	Slovakia	Carpathian Ruthenia	Czechoslovak Republic as a whole
9 . . .	17.74	21.57	21.46	31.09	35.21	22.37
0 . . .	23.13	26.10	29.14	32.66	34.29	26.60
1 . . .	23.94	27.40	31.50	38.22	43.60	29.02
2 . . .	23.07	25.74	30.08	36.85	46.68	28.05
3 . . .	22.48	25.17	28.39	36.02	43.44	27.26
4 . . .	21.17	23.88	26.45	33.90	43.90	25.84
5 . . .	20.72	23.36	26.39	32.39	41.56	25.11
6 . . .	20.12	22.65	23.84	32.31	41.24	24.53

(3) The rate of dead births is very high in certain industrial districts of rthern Bohemia. In the environs of Liberec, the number of dead births ches about 5 per cent, while in Carpathian Ruthenia the percentage is very all. The percentage of dead births in the several provinces and in the State a whole is given as follows:

	Bohemia	Moravia	Silesia	Slovakia	Carpathian Ruthenia	Czech Re as a
1919 . . .	2.95	2.53	2.17	1.55	0.82	
1920 . . .	2.94	2.49	2.65	1.69	0.55	
1921 . . .	2.83	2.48	2.32	1.55	0.85	
1922 . . .	2.96	2.36	2.34	1.81	1.01	
1923 . . .	3.01	2.35	2.22	1.93	1.36	
1924 . . .	3.07	2.30	2.49	2.05	1.23	
1925 . . .	2.81	1.89	2.24	1.93	1.20	
1926 . . .	2.78	2.03	2.35	1.99	1.57	

(4) The differences in the rates of illegitimate births are very great. occur most frequently among the Germans, especially in Northern Bo in Northern Moravia and in the German portion of Silesia; in these r about one-quarters of the births are illegitimate. The smallest number gitimate births is to be found among the Slovaks.

During the years 1923 to 1926 the number of illegitimate births pe living births was as follows:

	Bohemia	Moravia	Silesia	Slovakia	Carpathian Ruthenia	Czech Rep as a
1923 . . .	12.84	9.42	10.72	7.35	7.52	1
1924 . . .	13.23	9.69	10.74	7.48	7.96	1
1925 . . .	13.23	9.82	10.70	7.63	9.36	1
1926 . . .	13.58	9.77	10.98	8.04	9.34	1

(5) In the past Czechoslovakia suffered from a high mortality. T Bohemia, in the period 1881 to 1885, the death rate per 1,000 of the populat 29.35. Since that time, the death rate has declined regularly and to an inc extent. In 1900 it was 24.02 and in 1913 it was 19.18 per 1,000 of the lation. It decreased also after the war in all the provinces, and the r Slovakia and Carpathian Ruthenia, despite the high natality in thes vinces, is only slightly higher than in Bohemia, Moravia or Silesia. period 1919-26 the death rates per 1,000 of the population were as f

	Bohemia	Moravia	Silesia	Slovakia	Carpathian Ruthenia	Czech Rep as a
1919 . . .	17.72	17.85	18.71	19.56	22.66	1
1920 . . .	17.50	17.68	19.65	20.52	32.07	1
1921 . . .	15.85	16.37	16.83	21.31	26.90	1
1922 . . .	15.93	16.74	16.64	21.09	23.45	1
1923 . . .	13.87	14.02	13.50	17.59	20.54	1
1924 . . .	14.24	14.11	14.15	18.03	20.75	1
1925 . . .	14.23	14.17	13.54	17.71	19.69	1
1926 . . .	14.29	14.06	14.07	18.59	21.80	1

(6) Infant mortality was formerly very high in Czechoslovakia. During 1-85 the death rate of infants under 1 year of age per 100 live births was 4. It was especially high in a large number of districts inhabited by Germans. antile mortality began to decrease in the 'nineties, and in Bohemia and Moravia 1913 it was 18.3 per cent. After the war, it continued to decrease in Bohemia, ravia and Silesia, while in Slovakia and Carpathian Ruthenia it remained a le higher. During the period 1923-1926 the rate of infant deaths to 100 live hs is as follows:

	Bohemia	Moravia	Silesia	Slovakia	Carpathian Ruthenia	Czechoslovak Republic as a whole
3 . . .	13.82	13.40	13.78	16.13	17.82	14.71
4 . . .	14.02	13.17	14.99	16.10	17.57	14.80
5 . . .	13.40	13.08	13.44	16.78	17.38	14.63
6 . . .	13.69	13.26	14.83	18.02	19.81	15.43

(7) The natural increase (*i.e.*, excess of live births over deaths) is lowest Bohemia owing to its low birth rate. In Moravia it is considerably higher, l higher in Silesia and Slovakia, and highest in Carpathian Ruthenia. During 9 to 1926 the excess of live births over deaths per 1,000 of the population s as follows:

	Bohemia	Moravia	Silesia	Slovakia	Carpathian Ruthenia	Czechoslovak Republic as a whole
9 . . .	0.02	3.72	2.75	11.53	12.55	3.95
0 . . .	5.63	8.42	9.49	12.14	2.22	7.64
1 . . .	8.09	11.03	14.67	16.91	16.70	11.32
2 . . .	7.14	9.00	13.44	15.76	23.23	10.45
3 . . .	8.61	11.15	14.89	18.43	22.90	12.25
4 . . .	6.93	9.77	12.30	15.87	23.15	10.49
5 . . .	6.49	9.19	12.85	14.68	21.87	9.89
6 . . .	5.83	8.59	9.77	13.72	19.44	8.98

(8) The most important causes of death in the Czechoslovak Republic pulmonary tuberculosis, pneumonia, heart disease, cancer (which is more l more frequent), congenital debility and old age. A survey of the causes of ths for the whole State in the last four years is given in the following table:

Mortality by causes of Death in the Czechoslovak Republic in the Years 1923-1926.

Number of the International List of Causes of Death	Causes of Death	Death rate per 100,000 of the population			
		1923	1924	1925	1926
1	Typhoid and paratyphoid fever	7.49	8.04	8.05	8.31
2	Typhus fever	0.17	0.09	0.08	0.06
5	Malaria	0.33	0.17	0.19	0.19
6	Smallpox	0.36	0.23	0.27	0.06
7	Measles	6.61	9.81	10.52	11.64
8	Scarlet fever	8.67	5.04	3.52	2.51
9	Whooping-cough	11.49	7.32	12.52	20.18
10	Diphtheria	4.85	4.59	4.82	5.30
11	Influenza with complications	5.34	4.23	8.41	11.02
3, 4, 12-16	Relapsing fever, Malta fever, or miliary fever, mumps, Asiatic cholera and cholera nostras, dysentery	3.63	2.54	1.49	—
21	Erysipelas	2.32	2.76	2.74	3.11
23	Encephalitis lethargica	1.50	1.37	1.61	0.94
24	Meningococcus meningitis	0.55	0.37	0.54	0.67
26-28	Glanders, anthrax, rabies	0.33	0.33	0.27	0.18
31	Tuberculosis of the respiratory system	170.57	170.08	173.43	174.99
32-37	Other forms of tuberculosis	20.83	20.45	21.33	21.37
38	Syphilis	3.06	3.35	3.26	3.46
17-20, 22, 25, 29, 30, 40, 42	Other endemic, epidemic and infectious diseases	13.91	14.87	17.50	21.92
43 and 49	Cancer and other malignant tumours	90.20	96.84	99.37	107.51
57	Diabetes mellitus	5.12	5.31	5.08	5.39
50-56, 58	Benign tumours (tumours of the female genital organs excepted), rheumatism, osteoarthritis, gout, scurvy, pellagra, beri-beri, rhachitis, anæmia chlorosis	10.22	10.70	11.03	—
59-63	Diseases of the pituitary gland, exophthalmic goitre, diseases of the thyroid and parathyroid glands, diseases of the thymus gland, of the supra-				

97, 98, 102-107	Other diseases of the respiratory system	38.50	42.27	48.95	53.86
111-112	Ulcer of the stomach and of the duodenum and other diseases of the stomach (cancer excepted)	7.79	7.76	8.22	7.95
113	Diarrhœa and enteritis (under 2 years)	79.74	73.54	73.23	81.36
122	Cirrhosis of the liver	2.94	2.94	3.17	3.61
108-110, 114-121, 123-127	Other diseases of the digestive system	32.20	33.94	34.46	35.41
128, 129	Nephritis	22.00	23.07	23.86	24.09
130-136	Other diseases of the urogenital system (non venereal)	5.33	5.47	5.78	6.35
137-142	Benign tumours of the ovary and uterus, and other diseases of the female genital organs and non-puerperal diseases	1.19	1.00	1.17	1.37
146	Puerperal septicæmia	3.99	3.02	3.60	3.22
143-145, 147-150	Other puerperal diseases	4.87	4.98	4.77	5.13
151-155	Diseases of the skin or of the cellular tissue	8.41	7.84	7.24	6.41
156-158	Diseases of the bones and of the organs of locomotion	2.14	1.70	1.56	1.56
159	Congenital malformation (still-birth excepted)	2.11	2.04	2.11	2.06
160*b*, 161	Congenital debility, premature birth, or consequences of birth for the child	155.05	149.25	134.29	119.79
160*a*, 162, 163	Other diseases peculiar to early infancy	1.40	0.26	0.40	0.28
164	Old age	213.71	225.52	189.50	149.56
165-174	Suicides	25.53	24.18	25.42	28.08
175-182	Poisonings (except poisonings of blood and chronic poisonings), burns and scalding, suffocation or drowning	10.18	11.17	11.71	11.76
183-189	Traumatism	10.47	11.71	11.66	15.07
190	Wounds of war	0.57	0.36	0.04	
192	Deaths caused by malnutrition or starvation (deprivation of food or water)	0.10	0.14	0.16	—
197-200	Homicide and murder	2.16	1.69	2.00	2.60
191, 193-196, 201-203	Other external causes	4.60	5.81	6.00	3.32
204-205	Sudden death, unspecified or ill-defined causes	63.75	63.87	49.27	35.88
	Total	1,501.17	1,535.16	1,521.54	1,555.14

10. ANNEX.

INSTRUCTIONS FOR THE USE OF REGISTRIES OF BIRTHS, MARRIAGES AND DEATHS CONCERNING THE FURNI OF DATA FOR STATISTICS OF THE MOVEMENT OF POPULATI

General.

1.

For the purpose of obtaining precise statistical data on the movement population, four kinds of census forms shall be introduced as from Janua 1925, viz., the marriages form (specimen A), births form (specimen B), legit form (specimen C) and deaths form (specimen D).

2.

The Registrar shall fill up a special census form for each marriage, birth mation of an illegitimate child and for each death.

3.

Before entering a marriage, birth, act of legitimation or death in the re the Registrar must fill in the corresponding form according to the questions i If any data required are to be had from public documents brought by the the Registrar must examine these papers.

If the person making the declaration cannot answer all the questions, o written documents do not contain certain data which have to be entered on th the entry shall not on that account be postponed. The Registrar must in t require the party to furnish the data without delay and must fill up the for

If the Registrar is unable to obtain an answer to any of the questions co in the form (if, for example, it is impossible to establish the identity of a bo must indicate in the remarks column on the form why any question or q are left unanswered.

If the Registrar finds that a public institution repeatedly fails in its communicate the necessary data, he must report the fact to the Gove Statistical Office for action.

4.

All entries must be easily legible and may not be written in pencil. N must be entered in figures; everything else shall be written out in full, abbreviations.

5.

census form shall only contain births, marriages, legitimations and deaths
in the register under a serial number.
he entry is subsequently removed and the numerical series thereby inter-
such interruption shall be mentioned in the remarks column of the next

6.

sus forms which may not be folded either breadthwise or lengthwise shall
rded by the Registrar directly to the Government Statistical Office at Prague
ed official envelope, without any accompanying letter, at the latest on the
ach month. The consignment must contain all census forms referring to
ies of the previous month.
left-hand corner of the face of the envelope shall contain the lowest and
serial numbers entered and the number of census forms of each kind.
here are no entries for any one kind, the Registrar shall not send in a blank
ut shall place a nought in the relevant space on the envelope, and, if there
ntries at all, he shall send an empty envelope with a nought written on it.

7.

necessary printed forms and envelopes shall be supplied to the Registry
overnment Statistical Office at Prague. When the supply is nearly exhausted,
must be communicated to the Statistical Office by the Registrar when sub-
the monthly returns.
printed forms and envelopes may not be used for any other purpose, and
st be employed with due regard for economy. As corrections in the forms
wed and any errors or mistakes can be erased or corrected, few forms should
ed if care is exercised.

SPECIAL.

8. *Nationality.*

nationality is to be understood membership of an ethnical group, the outward
which is usually the mother-tongue. Jews may also declare themselves mem-
the Jewish nation. It is forbidden to indicate nationality by a statement
effect that the person in question belongs to a certain district, for example,
Moravian, etc.
tionality shall be entered as stated by the party concerned.

9. *Religion.*

Religion must be entered exactly. It is not enough to enter simply "Ca or "Protestant", but it must be indicated whether the person in question b to the Roman Catholic, the Greek Catholic or the Armenian Catholic Church, w to the Church of the Protestant Brotherhood, or to the Church of the Con of Augsburg, etc.

The legal situation at the time of entry shall alone be taken into accou

10. *Occupation and Status.*

Special attention must be paid to the column regarding occupation and s Such general descriptions as joiner, manager, merchant, or forwarding firm culture, building, Government service (provincial or communal), lawyer's offic will not suffice; mention must also be made of the position which the per question occupies in the trade or profession given; for example, master joi joiner's man, independent merchant or employee, architect or architect's licentiate, etc.

In the case of public officials or military persons, grade or rank shall be en

If the person concerned is without occupation at the time of entry, his f occupation and his position in that occupation shall be entered.

11. *Births.*

The births forms (specimen B) shall be filled up, not only for all live chi but also for all still-born children. With regard to the question when a child be deemed still-born, see note to No. 7 of the births form. This form must be up for every child, whether born alive, still-born, or dying immediately after As regards the birth of twins, triplets, etc., a special form must be filled u each child, but each form shall include a note "twin", "triplet", etc.

In the case of foundlings, the day, month and year when the child was shall be entered instead of the day, month and year of birth, and the fact tha child is a foundling shall be mentioned in the "Remarks" column.

If the child was born in a home, lying-in institution, hospital, or on board this must be noted in the "Remarks" column.

The name of the natural father shall only be mentioned on the form, pro his name is inscribed in the register of births in conformity with paragraph 1 the General Civil Code or paragraph 41 of Law XXXIII, 1894.

12. *Legitimations.*

The information necessary for filling up the census forms regarding legitim can generally be obtained from the act of legitimation or from the accompa documents.

13. *Deaths.*

the case of still-births or children dying at birth, no deaths census form
n D) shall be filled up, but only the births form.
regards found bodies, the day, month and year when the body was found
entered instead of the day, month and year of death, and the words "body
shall be noted in the remarks column.
rmation concerning the principal disease and the immediate cause of death
accurately entered on the deaths form, in accordance with the doctor's
e of death. The Registries must, whenever requested, forward the death
e to the Government Statistical Office for inspection.

Final Provisions.

14.

previous regulations concerning the statistical returns regarding the move-
population and the causes of death, viz., paragraphs 131-136 of Instruction
0/1906 regarding the registry of births, marriages and deaths in Slovakia
pathian Russia and the Decree of the former Austrian Ministry for the
dated February 8th and April 17th, 1895 (No. 18632 ex. 1894) and March 26th,
. 8973) for the rest of the country, are hereby cancelled.

11. BIBLIOGRAPHY.

PUBLISHED BY THE STATE STATISTICAL BUREAU, PRAGUE.

Předběžné výsledky sčítání lidu z 15. února 1921.

Vorläufige Ergebnisse der Volkszählung vom 15. Februar 1921.

Résultats préliminaires du Recensement de la Population du 15 février 192

Sčítání lidu v rep. Československé ze dne 15. února 1921. I. díl, II. díl. část

Volkszählung in der Čechoslovakischen Republik vom 16. Februar 1921, Ban Abteilung 1, 2, 3, 4.

Recensement de la population de la République Tchécoslovaque du 15 février Volumes I, II, Sections 1, 2, 3, 4.

Mouvement naturel de la population dans la République Tchécoslovaque en 1920.

Statistická příručka republiky Československé. I. II.

Statistisches Handbuch der Čechoslovakischen Republik. I. II.

Manuel statistique de la République Tchécoslovaque. I. II.

Zprávy Státního úřadu statistického. Roč. I. (1920) — VIII. (1927).

Mitteilungen des Statistischen Staatsamtes. Jahrg. I (1920) — VIII (19

Rapports de l'Office de statistique de la République Tchécoslovaque. Anné VIII, 1920-1927.

Československý statistický věstník. Roč. I. (1920) — VIII. (1927).

Bulletin statistique de la République Tchécoslovaque. Années I à VIII, 192

La Statistique tchécoslovaque, son développement et son organisation.

Statistický lexikon obcí v republice Československé podle sčítání lidu z r. 1 Čechy. — II. Morava a Slezsko. — III. Slovensko a Podkarpatská Rus.

Statistisches Gemeindelexikon der Čechoslovakischen Republik nach der Volksz v. J. 1921. I. Böhmen. — II. Mähren u. Schlesien. — III. Slovak Karpathorussland. Dictionnaire statistique des communes de la Rép tchécoslovaque.

PUBLISHED BY THE MINISTRY OF HEALTH.

Věstník ministerstva veřejného zdravotnictví a tělesné výchovy (Bulletin men Ministère de la Santé publique et de l'Education physique). Années 1919-1927.

IED BY THE MUNICIPAL STATISTICAL BUREAU OF PRAGUE.

tistická zpráva hl. m. Prahy (Annuaire statistique de la capitale de Prague), nnées 1919 à 1922.

áva o zdravotních poměrech hl. m. Prahy (Rapport sanitaire de Prague) 1897-909.

sční zprávy stat. kanc. hl. m. Prahy (Bulletin mensuel du Bureau de statis- que de la ville de Prague), 1925, 1926, 1927.

ATIONS OF THE LEAGUE OF NATIONS.

Official Vital Statistics of the Republic of Austria, C.H. 348.

Official Vital Statistics of the Kingdom of Hungary, C.H. 565.

rnational Health Yearbook, 1924, 1925, C. H. 349 and C.H. 477.

anisation of the Public Health Services of Czechoslovakia, by Dr. Hynek . Pelc, C.H. 268.

PUBLICATIONS.

vní město Praha. Studie o obyvatelstvu (La capitale de Prague. Etude démogra- hique), par le Dr Ant. Boháč, 1923.

ohlavních chorobách v republice Československé (Venereal Diseases in the Czecho- lovak Republic), by Dr. Hynek Pelc, Prague, 1923.

iální přehled tuberkulosy v Československu (Tuberculosis Survey of Czecho- lovakia), by Dr J ·Hůlka, 1922.

ta o tuberkulose v Československu. (Information regarding Tuberculosis in zechoslovakia), by Dr J. Hůlka.

tigations :

REPORT ON TUBERCULOSIS AND SLEEPING-SICKNESS IN EQUATORIAL AFRICA, by Andrew our, C.B., C.M.G., M.D., E. van Campenhout, M.D., Professor Gustave Martin, and . Bagshawe, M.D., being the expert Committee appointed by the Health Committee, ue of Nations, in 1922. (C. 8. M. 6. 1924. III.)	4/-	$1.—
REPORT ON TUBERCULOSIS AND SLEEPING-SICKNESS IN EQUATORIAL AFRICA, by the . (C.H. 281.)	2/-	$0.50

on of Sera, Serological Reactions and Biological Products :

ON THE INTERNATIONAL CONFERENCE ON THE STANDARDISATION OF SERA AND SERO-CAL TESTS convened by the Health Committee of the League of Nations and held from mber 12th to 14th, 1921, at the British Ministry of Health, London. (French and ish texts.) (C. 533. M. 378. 1921. III.)	1/6	$0.30
ON THE SECOND INTERNATIONAL CONFERENCE ON THE STANDARDISATION OF SERA AND LOGICAL TESTS, convened by the Health Committee of the League of Nations and held November 20th-26th, 1922, at the Pasteur Institute, Paris	1/-	$0.25
ON SEROLOGICAL INVESTIGATIONS, presented to the Second International Conference ie Standardisation of Sera and Serological Tests held at the Pasteur Institute in Paris ovember 1922	8/-	$2.—
ON THE EUROPEAN HEALTH CONFERENCE HELD AT WARSAW from March 20th-28th, 1922	1/6	$0.50
F THE TECHNICAL CONFERENCE FOR CONSIDERATION OF CERTAIN METHODS OF BIOLOGICAL DARDISATION, Edinburgh, from July 19th-21st, 1923	4d.	$0.05
ATIONS ON THE SERODIAGNOSIS OF SYPHILIS. Report of the Technical Conference held openhagen, November 19th to December 3rd, 1923. (Two Annexes.) (C. 5. M. 5. III./C.H. 148.)	3/6	$0.80
OF THE SCIENCE OF NUTRITION, by Professor Tadasu Saiki (C.H. 523. 1926. III. 25)	12/-	$3.—

COMMISSION: REPORT ON ITS TOUR OF INVESTIGATION IN CERTAIN EUROPEAN COUN- in 1924. (C.H. 273.)	6/9	$1.60
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Geneva, November 27th, 1926.

LEAGUE OF NATIONS

Health Committee

EIGHTH SESSION

Held at Geneva from Wednesday, October 13th, to Tuesday, October 19th, 1926.

LIST OF MEMBERS OF THE COMMITTEE.

r. Th. MADSEN, *President*,	Director of the State Serum Institute, Copenhagen.
. O. VELGHE, *Vice-President*,	Secretary-General of the Ministry of the Interior and of Health, Brussels.
. N. M. J. JITTA, *Vice-President*,	President of the Health Council of the Netherlands, The Hague.
ofessor Léon BERNARD,	Professor of Hygiene at the Faculty of Medicine of the University of Paris.
George BUCHANAN,	Senior Medical Officer of the Ministry of Health, London.
. H. CARRIÈRE,	Director of the Federal Health Department, Berne.
. W. CHODZKO,	Former Polish Minister of Health, and Director of the School of Hygiene, Warsaw.
ofessor Ricardo JORGE,	Director-General of Public Health, Lisbon.
. A. LUTRARIO,	Former Director-General of the Health Department of the Ministry of the Interior, Rome.
. P. MIMBELA,	Professor of the Faculty of Medicine, Lima.
ofessor B. NOCHT,	Director of the Institute for Tropical Diseases, Hamburg.
ofessor Donato OTTOLENGHI,	Professor of Hygiene at the Royal University, Bologna.
ofessor Gustavo PITTALUGA,	Professor of the Faculty of Medicine, Madrid.
. L. RAYNAUD,	Inspector-General of the Health Service of Algeria, Algiers.
. M. TSURUMI,	Representative of the Japanese Public Health Service.
. L. RAJCHMAN,	Medical Director, Secretary of the Committee.
Absent :	
Carlos CHAGAS, *Vice-President*,	Director of the Oswaldo Cruz Institute, Rio de Janeiro.
ofessor J. CANTACUZÈNE,	Professor at the University of Bucarest.
geon-General H. S. CUMMING,	Director-General of the United States Public Health Service, Washington.
A. GRANVILLE,	Former President of the Sanitary Maritime and Quarantine Council, Alexandria.
Alice HAMILTON,	Associate Professor of Industrial Hygiene, Harvard Medical School, Boston.

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FIRST MEETING.

Held on Wednesday, October 13th, 1926, at 3 p.m.

Present : All the members of the Committee with the exception of Professor Léon Bernard Professor Cantacuzène, Dr. Chagas, Surgeon-General Cumming, Dr. Granville, Dr. Alice Hamilton and Dr. Raynaud.

241. Opening of the Session.

The PRESIDENT proposed that a telegram should be sent to Professor Cantacuzène expressing to him the sympathy of his colleagues and their good wishes for his prompt recovery.

He welcomed Senator Pottevin, who was sitting for the first time as Director of the Office international d'hygiène publique. He regretted the absence of Professor Chagas Surgeon-General Cumming, Dr. Alice Hamilton and Dr. Granville.

He announced that Dr. Raynaud would arrive the following day and that Professor Léon Bernard would arrive on October 18th.

He reminded the Committee that the decisions of the Assembly had been favourable to the Health Committee and that special emphasis had been laid on the great importance of the work done by the Epidemiological Intelligence Bureau at Singapore.

242. Work of the Permanent Standards Commission : Report of the President.

The PRESIDENT, in his capacity as Chairman of the Commission, summarised and commented on his report (Annex 116). In regard to the anti-dysenteric serum, the State Institute of Serotherapy at Copenhagen had been asked to establish a standard serum, and it would during a period of twelve months, send this standard to all the laboratories, describing exactly the technique to be adopted in using this provisional unit.

Anti-pneumococcic serum was largely used in France, but much less in other countries where there still existed ideas which were sufficiently divergent to render the establishment of an international standard premature. This was also true of the anti-meningococcic serum As regarded the new specific methods for the diagnosis and treatment of and immunisation against scarlet fever, the American, British and Polish Institutes, in collaboration with the Institute at Copenhagen, would study the question and present a report at a later session.

The Tuberculosis Commission had received a report on tuberculin from Professor Calmette. It would be interesting to have a comparison made of the existing standards for tuberculin.

Sir George BUCHANAN said that the report of the Chairman showed the complexity of the work done by the Standards Commission and its various expert groups, so ably co-ordinated by Professor Madsen. He asked that an annex might be attached to the report giving more precise indications as to the units and standards adopted.

As regarded scarlet-fever serum, the object of the resolution of the Standards Commission was opportune if it were intended to limit the work to a laboratory comparison of sera actually available. If, on the other hand, the Standards Commission proposed to take up also the question of the value of the sera for immunisation against the disease and its cure, such an object, desirable though it might be, would involve an extension of the enquiry which seemed to go beyond the terms of reference of this Commission.

Finally, he would like to know whether the President could give at once any indication of the points in the biological and serological field which were ready for practical study by the Commission in the near future.

Dr. CHODZKO said he was very pleased to note that the Standards Commission was contemplating an investigation into the serum for scarlet fever with a view to establishing the standard, all the more so as the experiments made with this serum during the present epidemic of scarlet fever in Poland had been very encouraging. A similar impression would result from reading the report of Professor Preisich recently submitted to the Medical Society at Budapest. The children's doctors in Poland were unanimous in declaring that the results obtained were the most rapid and surprising which had been observed since the introduction of the anti-diphtheritic serum into medical practice.

It would also be extremely desirable to settle the question of the composition of the anti-scarlet-fever vaccine first introduced by a well-known Polish doctor, the late Gabryczewski. It seemed that there was some dispute as to priority between Gabryczewski, posthumously and Dicks.

He would take this opportunity to ask the President to be so good as to inform the Health Committee as to the position of the question of the biological products used against whooping-cough in Denmark and the work done in this field by the State Serotherapeutic Institute of Copenhagen as well as the surprising results which seemed to have been already obtained.

Finally, he would be happy to have details in regard to the serum against whooping-cough.

Dr. RAJCHMAN said that the appreciation of the results obtained by the serum and the vaccine against scarlet fever did not come within the field of the Permanent Standards Commission. Resolutions on this subject would be found in the special report of the Child Welfare Health Experts, and there would be an opportunity of discussing them when that report came up for consideration.

Sir George BUCHANAN said that if, at present, it was merely a question of verifying the purity and strength of the sera or vaccines, he could accept the proposals made in the report.

The PRESIDENT added that the American report, which gave detailed indications as to the establishment of the standard anti-tetanic serum, might be placed at the disposal of Sir George Buchanan.

The investigation which had been decided upon concerning scarlet fever was purely technical, and hitherto researches had not gone beyond the field of the laboratory.

Referring to the question of Dr. Chodzko concerning whooping-cough, he would state that the National Institute of Serotherapy at Copenhagen was at present one of the very few institutes which practised bacteriological diagnosis as a routine method. He would present a report on this question and on vaccination against this disease.

243. Provisional Report on the Work of the Sleeping-Sickness Commission.

Professor OTTOLENGHI wondered whether it would not be advisable to add to the programme of work of the Commission a continuation of the investigations into the development of trypanosomes in the glands of the tongue, with the object of throwing light on the real part played by these trypanosomes in the preservation and development of the virus. This was a problem of very great biological and practical importance, which it had hitherto been impossible to settle. The Commission would be able to take it up again all the more easily as it was working on the spot where sleeping-sickness was raging, and as one of the members of the Commission had already studied this problem with very promising results.

Dr. RAJCHMAN replied that it was difficult for the Health Committee to suggest this new subject of enquiry, as the programme of work had already been determined by an international conference specially convened for that purpose. The Commission had chosen a certain number of subjects on the spot, and a prolongation of six months would already be necessary to deal completely with these questions. In any case, it would be necessary first to obtain the views of the Governments represented at the London Conference.

Sir George BUCHANAN asked whether it was proposed that the Health Committee should formulate a resolution recommending the prolongation of the work of the Sleeping-Sickness Commission for the further period of six months. He had reason to believe that the British Government and the Governments of the British territories which were concerned would not be averse to continuing the subsidies for that period.

The supplementary task indicated by Professor Ottolenghi was interesting. It had been settled, however, that the present Sleeping-Sickness Commission could only undertake a certain defined programme and could not be continued with the intention of investigating all the problems of this disease. The greatest need, perhaps, was a drug which would cure sleeping-sickness as effectively as novarsenobillon cured yaws. Further, a point of first importance was the necessity of a control simultaneously exercised on both sides of the common frontiers.

M. VELGHE said that this question had been taken up at the beginning of the work of the Commission and that the Governments had been asked to give the necessary instructions.

Senator POTTEVIN thought that a Convention between France and Belgium was already in existence.

Dr. RAJCHMAN thought that it would be useful for the Health Committee to adopt a resolution supporting the request for prolonging the work proposed by Dr. Duke. The funds at present available would enable the work to be continued for another three months, and in the budget of the Health Organisation for 1927 it would be possible to earmark a grant in aid.

The necessary co-operation on either side of the common frontiers was a point which the Commission of Experts would be qualified to settle. A draft resolution with regard to the work of the Commission would be presented at a future meeting.

244. Examination of the Report of the Medical Director on the Work accomplished since the Sixth Session of the Committee.

Appendix (*a*), Service of Epidemiological Intelligence and Public Health Statistics, of the report of the Medical Director (Annex 108) was read.

Dr. TSURUMI said he was happy to learn that the Health Section had begun to receive information on the incidence of epidemic diseases in China in spite of all the political and administrative difficulties existing in that country. It was very desirable that the Committee should appreciate this new fact and encourage the National Epidemic Prevention Bureau at Pekin to furnish epidemiological information regularly in the future.

He also learned with satisfaction that the last Assembly had inserted in the budget of the Health Organisation a contribution towards the expenses of the Bureau at Singapore, and he had asked that this question should be examined at the sixth session of the Committee.

This was an indication of the way in which the League of Nations appreciated the work o that Bureau, which he hoped would continue to develop.

With regard to the notifications and other epidemiological information at present forwarde by the Bureau at Singapore, he entirely agreed with the views of the Medical Director, and h hoped that the Committee would endorse his opinion.

Sir George BUCHANAN said that, having been present for several days during the wor of the Assembly, he could bear witness to the interest shown by the Second Committee and b the Assembly in the work and maintenance of the Bureau at Singapore. This interest wa largely due to the fact that the Bureau was carrying out effectively a task undertaken by th League of Nations in the Far East and controlled by the representatives of the Government in the Far East. He hoped that the Medical Director would give information in regard to th significance of the resolution of the Assembly relating to the budgetary contribution. Was i necessary for the Health Committee, at this session, to indicate, for the convenience of th Advisory Council at Singapore, how much money it would be possible for the League to pu at the disposal of the Bureau for the expenses of the coming year ?

The observations which the Medical Director had already made on the utility of thi Bureau in connection with the tasks imposed by the new International Sanitary Convention were extremely instructive. In his opinion, the Office international d'Hygiène publiqu should invite the League of Nations to permit it to use the Bureau at Singapore as largely as possible, for the objects which it considered essential, in connection with its execution o all the duties imposed on it by the Convention. He hoped that a satisfactory agreemen in this sense could be concluded in Paris.

The report of the Medical Director contained some expressions and implications regarding the duties of the Paris Office under the Convention which, in his personal view, needed some modification before they could be accepted as exact. The question of these duties, however in the first instance concerned the Paris Office, where they would be discussed in the nea future. If the point might be noted, he would not trouble the Committee with observations on the particular phrases he had in mind.

Dr. CARRIÈRE confirmed the declarations of his colleagues. Thanks to the Bureau a Singapore, he was able to ensure a periodical and regular publication of short summaries giving precise information as to the movements of epidemics abroad, whereas, hitherto, this information had been vague and incomplete.

Dr. JITTA said that the Government of the Dutch East Indies desired to endorse the tributes paid to the working of the Bureau, for the information thus obtained was extremely valuable to health authorities.

Dr. RAJCHMAN, replying to Sir George Buchanan, said that, as a result of the resolution proposed by the Japanese delegation, supported by several other delegations in the Second Committee, a Sub-Committee had considered the amount of the special credit which should be inserted in the budget of the Health Organisation of the League for the Bureau at Singapore.

Following a thorough discussion of several proposals by this Sub-Committee, the Second Committee had unanimously proposed to the Fourth Committee to increase the budget of the Health Section by 25,000 francs. It was pointed out that, if account were taken of the fact that provision had been made in the health chapter of the budget for a German member, consequent upon the entry of Germany into the League and the resultant additional contribution, the maximum figure of 1,000,000 francs agreed upon last year had not in fact been exceeded, but that, on the contrary, the budget had actually been decreased as compared with that of 1926.

The Fourth Committee, on the recommendation of the Supervisory Commission, had decided that the budget of the Section could only be increased by the difference between 1,000,000 francs and 991,000 francs, the total of the original estimates for 1927. Ten thousand francs had therefore been added under Article 23, II, 3 (Sanitary Notifications and Epidemiological Enquiries), the title of which had been changed to "Sanitary Notifications, Singapore Bureau and Epidemiological Enquiries". The provision for "Cables, Telegrams and Telephones" had been reduced by 1,115 francs, thus bringing the budget within the maximum figure of 1,000,000 francs.

The principle of a contribution for the Bureau was thus admitted and a credit had been inserted in the budget in a form which enabled the expenditure therefrom to be made proportionate to the actual requirements. The Singapore Bureau would, within a few weeks, submit its budgetary estimates and it could then be seen to what extent it would be necessary to call upon the credit provided in the budget of the Health Organisation of the League.

M. VELGHE observed that the report emphasised the lack of uniformity existing between the various systems of notification. Forty-seven countries sent weekly reports, eight countries sent reports every ten days, ten countries sent reports twice a week, and sixty-nine countries sent monthly reports. In his opinion, a report sent every ten days had the double advantage of applying to a short period and of being adaptable to the monthly period. He would like to know what proposals Dr. Rajchman was prepared to make in order to secure uniformity.

Dr. LUTRARIO thought that it was extremely desirable to secure uniformity. Unhappily, this question presented serious difficulties. The period of ten days did not fit in exactly with months of more or less than thirty days. On the other hand, the weekly period had been generally adopted in the majority of the conventions concluded between particular countries.

Dr. CARRIÈRE added that the great majority of the present statistics were established according to the weekly period. It was necessary to arrive at a uniform rule in the manner of reckoning the week.

Dr. RAJCHMAN replied that, in the passage of the report in question, he had merely repeated the suggestion which would be found in almost all the previous reports. The weekly period mentioned by Dr. Carrière was generally adopted. Within the year, the two invariable periods were the week and the quarter. It had been agreed in the East that the seven days of the week should end at midnight on Saturday. He had confined himself in his report to indicating that it would be useful to adopt a uniform period, but he had not put forward any precise proposal. He would be happy if the Committee would authorise him to examine during the year 1927 whether it was advisable to make an effort to achieve uniformity.

M. VELGHE said that his question was due to his conviction that the desire for uniformity should not remain merely platonic. At present, several countries retained their original system from force of habit. He hoped that Dr. Rajchman would get into touch with these countries in order to secure greater uniformity.

Sir George BUCHANAN said that attempts to secure minute degrees of unification of these statistics of notified diseases had little real advantage when one considered what notification signified, and for what purposes a given country needed to know about infectious diseases in another country. He was opposed to the Health Organisation entering into details of national administration in matters of this sort.

The PRESIDENT proposed that Dr. Rajchman should study the question and submit precise proposals in order that the Committee might see whether it was advisable to make representations to the Governments.

Dr. RAJCHMAN observed that, if this enquiry were to begin with Europe, an understanding would be almost wholly realised at the outset, since all the countries submitted weekly reports except Belgium. He would submit a detailed report on the matter at the next session.

In reply to a question of Dr. Tsurumi, Dr. Rajchman stated that the Advisory Council of the Bureau at Singapore would be meeting in January 1927, and that Dr. Gautier, of the Health Section, who was now at Singapore, would represent the Secretariat.

Sir George BUCHANAN emphasised the usefulness of the series of statistical handbooks. He hoped that the publication of these handbooks would be continued and that the issue of those already prepared would be hastened.

The report on the Epidemiological Intelligence Service was adopted, with the exception of the part relating to the Statistical Committee, consideration of which was adjourned on the request of Dr. Jitta.

SECOND MEETING.

Held on Thursday, October 14th, 1926, at 10.30 a.m.

Present : All the members of the Committee, with the exception of Professor Léon Bernard, Professor Cantacuzène, Dr. Chagas, Surgeon-General Cumming, Dr. Granville, Dr. Alice Hamilton and Dr. Raynaud.

45. Examination of the Report of the Medical Director on the Work accomplished since the Sixth Session of the Committee (*continuation*).

Public Health Administration and Health Insurance.

The chapter of the report of the Medical Director on this subject was read (Annex 108, Appendix *c*).

The PRESIDENT suggested that the chapter should be discussed paragraph by paragraph.

Paragraph 1.

Sir George BUCHANAN said he presumed that the programme of the future enquiry referred to at the end of paragraph 1 would come up for consideration by the Health Committee at a later stage and that the Committee was not at that moment called upon to take a definite decision. If, at that later stage, the enquiry was considered to be of sufficient importance, the Committee might usefully decide to deal with these insurance questions through a standing committee or at least to have one of its members associated with the investigators as a rapporteur. He was not making any suggestion to this effect at that moment, but he considered that the participation of members of the Health Committee in expert work one for the Committee was important.

Dr. CHODZKO emphasised the importance of the proposal made by Sir George Buchanan, and recommended his colleagues to adopt it. The Committee was still dealing with the preliminary stage of the question and, for the moment, all that was being done was to collect documents. Doubtless a programme would emerge when these documents had been collected. It was, however, necessary that a certain direction should be given to the work which was to be undertaken, and the Health Committee would perhaps desire to indicate this direction in advance.

Dr. RAJCHMAN said that Sir George Buchanan and Dr. Chodzko had raised two questions.

As regarded the programme of the enquiry which was to be submitted to the Committee it must be realised that this was not an enquiry of the Health Committee itself. A year ago the Committee had asked the Health Section to make a preliminary study of the question in co-operation with the Ministry of Health of Czechoslovakia. The health administration with which the Secretariat had got into touch had appointed investigators, each of whom had begun an enquiry in his own city. These investigators had met at Geneva in order to compare their results, and on the basis of this comparison it had seemed to them possible to continue to carry out a plan of enquiry in districts chosen by themselves. This plan would eventually be extended to other cities. It did not seem necessary, at least for the moment, to discuss this plan of enquiry in detail. The Health Section would have finished the preparation of this plan within a few weeks, and it would be immediately communicated to the members of the Committee. In order to avoid any misunderstanding, it was necessary to lay down that the investigators would continue their enquiries on the basis of this plan, as the work was still in the preliminary stage.

As regarded the appointment of a Rapporteur, or, as Dr. Chodzko seemed to suggest of a committee, it would be premature to take a decision during this session since it was still difficult to decide whether a special committee of the Health Committee would be necessary. On the other hand, it was indispensable that a limited group of experts should be appointed to continue the enquiry. This point might be discussed at the same time as paragraph 6 of the present chapter.

Paragraph 2.

No observations.

Paragraph 3.

Dr. CARRIÈRE said that it would be advisable to extend the enquiry to Basle, where 80 per cent of the population were subject to compulsory sickness insurance.

Dr. RAJCHMAN said that it was proposed to undertake an enquiry in Basle.

Dr. CHODZKO emphasised the importance of a study of special insurance against tuberculosis in England, an insurance which had been working for some time with excellent results.

Sir George BUCHANAN said that any assistance in the matter which might be afforded in Great Britain would be very willingly given. He hoped that, when the results of the preliminary enquiry were embodied in a report, it would be very clearly stated what precisely were the "preventive principles" which were being considered. "Preventive" was a term which could be used in many different senses in medical work. It was necessary to be clear on the question whether the investigators were using the term in the narrower sense of general sanitation, inoculation and public health administration, or whether they included the ordinary treatment of disease which, if started in time, prevented graver consequences. In cases like tuberculosis or venereal disease, moreover, treatment and prevention tended to become identical.

The PRESIDENT said that it was proposed to extend the enquiry to a city in Denmark. Perhaps this proposal did not sufficiently take into account the efforts being made in Denmark. The system of insurance had met with great success in that country because it dealt with a very large proportion of the population, including the rural population.

Dr. RAJCHMAN said that the passage of the report might be amended as follows : "To extend the enquiry to a district of Denmark". It had seemed that, in the first stage, the enquiry should be made in Copenhagen. He would emphasise, in passing, that the International Labour Office was particularly interested in insurance as applied to rural districts. The enquiry, moreover, might be usefully extended to Belgium.

Professor PITTALUGA explained that, in Spain, compulsory insurance did not exist, but that two important institutions were dealing with it, the National Provident Institution at Madrid and the Provident Fund for Old Age and Sickness at Barcelona. At Barcelona, the Provident Fund did not cover less than 40 per cent of the working population and was doing social work of the first importance. It was advisable to devote a special enquiry to Barcelona.

Dr. RAJCHMAN, replying to Sir George Buchanan, said that obviously, in the plan of enquiry, as clear a definition as possible would be given of what was meant by "prevention". He was glad that Professor Pittaluga had referred to the admirable work which had been done in Spain. It would be necessary later on to give a summary at least of the position in certain towns or certain countries in respect of insurance. He would, however, emphasise the very complicated nature of the question. Very interesting reports had been furnished giving the first results of the enquiry, but these reports were extremely voluminous. The Secretariat desired to proceed methodically and to keep the enquiry within certain limits. All this material would have to be digested before any further step forward could be made. During the first stage, the work would be limited to some ten towns. The time would come when it would be necessary to obtain the views of experts. This point might be discussed when paragraph 6 of the chapter was considered.

Paragraph 4.

Dr. JITTA drew attention to the enquiry into rheumatism. Some months ago, an International Society had been founded for the study of this question, including countries in Europe and America. This society was endeavouring to institute local societies in the various countries. It would be to the mutual advantage of the parties if relations could be established with this society.

Sir George BUCHANAN observed that it was assumed in the report that the method of discovering the amount of rheumatism prevalent in a country was to examine all the records of sickness insurance. A few years ago, this question had been very carefully considered at the British Ministry of Health and large quantities of cards relating to insured persons had been carefully studied. The conclusion had been reached that it was impracticable to attempt to get useful information concerning the prevalence of rheumatism, or concerning the kind of case which was included in the term rheumatism, by relying on analyses of the ordinary diagnosis cards of insured persons as a whole. A new plan had therefore been adopted. Some eighty insurance doctors had been selected, in representative areas all over the country, to keep special records, according to a settled classification, of every case which would normally be reported as "rheumatism". The large and satisfactory sample thus obtained gave results which were analysed in all their bearings, and could be relied upon as applicable to the whole country. The sampling method wanted much planning and visiting from headquarters, but it was worth the trouble. Any study of the use of medical-insurance systems to promote medical knowledge would perhaps be better directed to the possibilities of accurate sampling than to collections of mass statistics. The best doctors in the matter of treatment might be also the best record-keepers, but they often were not.

Dr. RAJCHMAN said he was glad to hear the suggestions of Dr. Jitta and Sir George Buchanan. The Health Section had no intention of undertaking an international enquiry into rheumatism. The report contained a reference to rheumatism only in order to illustrate the way in which the Health Committee might facilitate the work of the national committees already constituted. If the Committee thought that this question should be studied during the enquiry, the Section would get into touch with the International Society in order to avoid overlapping. He would be delighted to be able to discuss with British experts whom Sir George Buchanan would name the experience acquired in England, and to put the Viennese Committee, which was studying the question of rheumatism, in possession of the facts collected in that country.

Paragraph 5.

Dr. CHODZKO asked whether the members of the Committee would be able to receive the report on the financial aspect of social insurance.

Dr. RAJCHMAN replied that it would be difficult to roneograph all these documents. The report would be communicated to those of the members of the Committee who were interested in the question.

Paragraph 6.

Sir George BUCHANAN said he would like to know whether the suggestion about the employment of a small number of experts contained in this paragraph was one for future discussion. He understood that it was a suggestion intended to apply when the Committee would be in possession of the results of the preliminary studies, and that the Committee would be able to discuss the matter with all the necessary information at its disposal. He could not at that moment assent to the proposal without knowing more precisely what the position would be.

Dr. RAJCHMAN said he was entirely in agreement with Sir George Buchanan. It would be premature at that moment to appoint a committee of experts to discuss questions of legislation. It was advisable to adjourn these enquiries until the Health Committee was in a position to discuss in detail the results of the preliminary investigations. It would, nevertheless, be extremely helpful to have a small committee of experts in order to take note of the reports prepared in the different countries and to co-ordinate the progress of the enquiries which were being undertaken in those countries. There were at present in progress investigations at Cologne, Vienna, Budapest, Prague and Warsaw. It was proposed to extend them to Denmark, Basle and Belgium. There would thus be eight centres of enquiry. The proposed Committee would be fairly limited in size and might be constituted on the same basis as the Committee of Child Welfare Health Experts. It would include investigators appointed by the health administrations in order to continue this enquiry, and perhaps one or two specialists particularly interested in the question. For the moment, the sole object was to study the preliminary reports which would be received and to submit precise proposals to the Health Committee.

The Committee referred to in paragraph 6 of the report would have to examine the questions put to it by the Health Committee. Its rôle would therefore be quite different from that of the first Committee, which would have to formulate, in view of the discussions and decisions of the Health Committee, the observations and conclusions emerging from the reports presented on the basis of the preliminary enquiries made in the eight or nine different centres.

If the Health Committee admitted the principle of appointing a Committee of experts of this character, the officers of the Committee might, within the next few months, examine, with the Secretariat, the best method of constituting this Committee and the appointments to be made.

Sir George BUCHANAN said that he thought it might be desirable to get the workers together in a conference as soon as the material was adequate. In his view, the conference should be a meeting of those persons who had been engaged in the work and who could contribute information from the various countries. But if anything like a standing Committee of experts on insurance problems were appointed, this Committee should include members of the Health Committee, who would be able to report to the Health Committee and to keep it in touch with the progress of the work.

Dr. RAJCHMAN stated that, for the moment, all that the Section would do would be t convene a conference of experts. These members would have to meet two or three time in the course of the year.

M. VELGHE associated himself with the suggestion which had just been made. The ques tion, however, was very wide and, in order that this conference should not go astray and los sight of the object in view, it would be necessary for it to be presided over by the Medica Director or by one of his assistants.

Dr. RAJCHMAN approved in principle the suggestion of M. Velghe. The Secretaria had taken up this enquiry and constituted, in every sense of the word, the technical Secretaria of the conference. Moreover, the experts had always consulted the Section regarding thei preliminary enquiries, and he would assure the Committee that they would continue to do so

M. VELGHE said that literature on this point already existed at the International Labou Office, which was considerably interested in the question. It would be advisable for these tw organisations to work together in order to avoid overlapping and in order that each migh benefit from the work of the other.

Dr. RAJCHMAN replied that the Secretariat had constituted, with the International Labou Office, a Mixed Committee, which was examining the plan of enquiry. He would point out in passing, that the note under discussion had been drafted in agreement with the representa tives of the International Labour Office. The International Labour Office was convening in 1927 an international conference on questions of sickness insurance, in regard to which it would furnish a fairly detailed collection of documents. The Secretariat had already examined with the International Labour Office the question whether, in the event of certain documents relating to this enquiry being published, it would be advisable that the publication should be made jointly, not only in order to bring the enquiries into harmony but also with a view to economy.

M. VELGHE thanked the Medical Director for having anticipated his wishes.

Dr. MIMBELA emphasised the importance of an international conference. The real object to be achieved consisted in putting the various national legislations into agreement with the principles which would be adopted. In the report to be submitted to the next Assembly, it would be useful to emphasise the importance of the international conference with the object of introducing into the national legislations modifications in conformity with the conclusions attained.

Dr. RAJCHMAN asked Dr. Carozzi whether he could give any information concerning the conference convened by the International Labour Office for May 1927.

Dr. CAROZZI said that, so far, he had only distributed a questionnaire. The documents were in course of preparation.

Dr. RAJCHMAN explained that the International Labour Office had sent an extremely detailed questionnaire. He believed that the Sickness Insurance Service of the International Labour Office was preparing a draft international convention on the subject.

Dr. CAROZZI said he would be happy to forward the questionnaire to the members of the Committee.

International Rabies Conference.

The chapter of the report of the Medical Director on this subject was read (Annex 108, Appendix *d*).

Dr. RAJCHMAN explained that the Secretariat had quite recently received a very detailed report from the British Ministry of Health, for which he cordially thanked Sir George Buchanan. The replies received up to the present constituted already a fairly large file. This was the first time for five years in which so many replies had been received in so short a period. It seemed that this Conference was extremely popular, and that it would be a scientific event of the first importance. As to the date, Dr. Calmette had suggested Monday, April 25th, 1927.

The Secretariat had prepared a draft invitation, which would be examined next week at Paris with Dr. Calmette. If the Health Committee agreed, the bureau would take the final decision in regard to the text of the invitation, and the invitation would be sent without further delay. It was necessary to warn all the delegates as soon as possible, as some of them would come from very distant countries. The expenses of the delegates would be met by their Governments, and the Section would only have to support the expenses of the technical Secretariat, the drafting of the minutes and the documents.

Professor PITTALUGA said that, in the Argentine and Brazil, the directors of the Anti-Rabies Institutes had expressed the liveliest interest in the future Conference. This was also true of the head of the Anti-Rabies Branch of the Health Institute in Madrid, Dr. Ramon Fañanas.

Would it not be possible to arrange for the next session of the Health Committee to be convened before the Conference ? Certain members of the Committee might perhaps have observations to make, not of a strictly scientific character but rather of a statistical character, and these observations might be communicated to the Conference. If the Committee could not meet before the Conference, perhaps these observations might be communicated through the Health Section.

Dr. CARRIÈRE said that the reply of Switzerland was ready and that it merely required the signature of the Rapporteur, who was for the moment absent.

Dr. LUTRARIO emphasised the extreme importance of the Conference, both from a scientific point of view and from the practical and preventive points of view. For several years a disquieting recrudescence of rabies had been noted. In Italy, it was compulsory to notify not only cases of rabies in men and domestic animals but also cases where persons were bitten by suspected dogs. Since 1921, the number of these declarations was as follows :

	Bites	Rabies Cases
1921	3,958	576
1922	5,464	82
1923	7,899	113
1924	8,404	156
1925	9,415	163

The proportion between cases of rabies and the number of bites thus varied each year from 1.4 to 1.6 per cent.

The proposed Conference, therefore, met a necessity of the moment, all the more so as the programme contained extremely interesting questions, such as the problem of vaccination after a bite by a domestic animal, and of the preventive vaccination of dogs, etc. The Italian Health Administration was energetically endeavouring to deal with the present alarming situation. The number of Anti-Rabies Institutes, since the recrudescence of the disease had been noted, had been increased from 16 to 28, a measure which was additional to the veterinary regulations applied throughout the country.

Professor NOCHT thought it was understood that the object of the Conference would be not only to discuss the various methods of vaccination but also to examine the various legislations and measures taken to protect men and animals against rabies. He thought that such an enquiry was very important. In Russia, there was a veritable epidemic of rabies, and steps were indispensable in the neighbouring countries.

Dr. RAJCHMAN replied that the question of legislation was included in the questionnaires sent to the Institutes. Two notes would be prepared : one by the Pasteur Institute, giving a general survey of the present state of knowledge from the scientific point of view, and probably based also on the replies received ; the other by the Secretariat, summarising in a fairly detailed manner all the replies obtained.

Dr. TSURUMI explained that, in Japan, cases of rabies had been fairly frequent up to the present. The Japanese doctors had therefore had many occasions to make scientific investigations into the subject. He hoped that Japan would contribute to the work of the International Conference on Rabies in Paris.

Dr. CHODZKO understood that the question of rabies in general was before the Health Committee, which would examine the resolutions of the Conference.

The PRESIDENT explained that the Conference would obviously be, in the first instance, of a scientific character. If, however, practical proposals were made, the results would be submitted to the Health Committee, which would study them and examine what action should be taken.

International List of the Causes of Death and the Statistical Committee.

The chapter of the report of the Medical Director on the International List of the Causes of Death was read, together with the note on the Statistical Committee (Annex 108, Appendix *e*, and paragraph 11 of Appendix *a*).

Dr. TSURUMI proposed to explain during the session the reply made by the Japanese Government.

Dr. LUTRARIO noted with satisfaction that the Health Committee was studying the question of the appointment of a Committee of statistical experts.

As regarded the International List of the Causes of Death, obvious difficulties prevented any comparison between the data obtained by the various countries. This had been shown recently by the experience of the Cancer Commission. The indications as to the causes of death given on the cards seen by the members of this Commission were very often too general, for example, those concerning senility. Such indications were very inconvenient from the point of view of statistical data. Death certificates frequently mentioned chronic pneumonia, whereas the actual disease was tuberculosis. Similarly, on the Italian death certificates, for instance, the indication "arthritism" was frequently given, and such a description gave no exact idea of the disease which had occasioned death. This would be one of the first questions to be submitted to the Committee of experts.

There was a still more important question. In many countries, a large number of certificates, possibly from 50 to 75 per cent of the total number, referred the death to "cause unknown", so that it was impossible to form any idea concerning the instance of certain diseases. The question of the multiple registration of causes of death should accordingly be thoroughly examined by the Committee of experts. It was necessary to make an attempt to eliminate indications which were too general and to emphasise that it was essential to indicate on the certificates both the first cause and the final cause of death.

It would be well for the health administrations to draw the attention of doctors to these points.

Dr. JITTA believed that all his colleagues agreed with Dr. Lutrario. A revision of the International List of the Causes of Death was indispensable.

Another question arose, which was practical and more particularly diplomatic in character namely, the question of the collaboration between the Health Committee and the International Institute of Statistics. It was easy to understand why this Institute had not accepted the proposal made to it that it should give its views on the conclusions which the Health Committee and its experts might reach. The Institute claimed the right of itself establishing the International List of the Causes of Death. In 1891, it had discussed the first list, and the list was revised every ten years by a conference which had hitherto been convened by the French Government. Doubtless the Institute had not formerly taken sufficient account of medical considerations, and the medical element had been inadequately represented at its conferences. It proposed, however, in future to modify its procedure. Had the Medical Director any other proposal to make which might bring the various parties into agreement? The proposal of the Institute for the appointment of a mixed committee, including an equal number of representatives of the Institute and the Health Committee, was open to objection but it should be possible to find a basis of agreement.

Professor JORGE alluded to the last sentence of the chapter in the report of the Medical Director on the International List of the Causes of Death :

> "In considering this question, it should be borne in mind that many of the problems raised will demand for their solution expert knowledge of medical and pathological terminology rather than of statistical procedure, and that administrative questions of considerable importance are involved."

It must be recognised that the medical and pathological terminology used was very uncertain, and that it had defects not only from the scientific but even from the philological point of view. Doctors tended to retain the ancient vocabulary, which was very often obsolete and sometimes absurd. Thus, the word "typhus" should not be retained in any modern terminology, as it led to regrettable confusions. In short, it was advisable rather to forget the present terminology than to have any thorough acquaintance with it. There were certain terms, even, which it was impossible to define, as, for example, "arthritism".

Another question raised difficulties which were even greater, namely, the question of statistical method and the classification of diseases. Diseases of the throat, for example, were included under diseases of the digestive organs. His colleague Dr. Lutrario had raised the question of the sequence of diseases — in other words, the succession of causes which were responsible for death. In present statistics, the successive causes were arbitrarily disconnected more particularly in the registration of the causes of death. In short, the medical and pathological terminology would have to be thoroughly readjusted. As to the statistical method whatever might be the terminology adopted, the critical problem would be to discover methods which would be reasonable and practical.

Sir George BUCHANAN observed that, at the end of the note on the Statistical Committee in the Medical Director's report, it was suggested that the proposed Committee would deal with special questions submitted to it by the Commissions, such as tuberculosis, infant mortality, etc. He doubted if a Statistical Committee were necessary for this purpose. If the Commissions dealt with statistical questions continuously, they had, or should have, statistical experts among their members. If, on the other hand, they merely desired statistical assistance in dealing with occasional questions, they might resort to the experts of the Health Section in the Secretariat or in their own countries. He was not in favour of appointing a specialised Statistical Committee.

Possibly, however, a Statistical Committee might be necessary for the Conference on nomenclature. This Conference would have to consider under what causes deaths should be entered, and also to deal with other very important questions, such as the certification and classification of primary and secondary causes of death. It was possible that it would be necessary to appoint a Statistical Committee for this specific purpose. But it was desirable first to look at the matter from a more general point of view than that of statisticians. It was essential to consider what sort of preparatory work would be required. In this connection would arise the question of the part to be played by the International Institute of Statistics. He had read the correspondence with the Institute, and there was one point on which he did not agree with the Institute, namely, that it had a prescriptive right to deal with the decennial revision of the nomenclature. He could not find any historical basis for this view. Dr. Bertillon had worked on this subject with a special Committee of the Institute, but the work had never been referred to the Institute as to a general Assembly which would have to sanction the conclusions of the Special Committee. On the other hand, there was every reason to avoid friction and to secure the co-operation of the Institute.

He did not think there was any need for haste in the matter. The first stage was to obtain the suggestions put forward in the individual countries in view of the next decennial Conference, and especially the observations of those Governments which were dealing with the subject thoroughly by means of national committees. Considerable progress had already been made in England, where Dr. Stevenson, the medical adviser of the Registrar-General, had carefully examined the existing international nomenclature and submitted observations. Having obtained these observations, the Government proposed to appoint a special committee, on which, for example, the universities and the general practitioners could be represented together with the registrars of statistics of the three parts of the United Kingdom. This Committee could obtain the aid of authorities in different branches of medicine, as necessary. The British Government might in this way be able next year to present a statement concerning

the modifications which it considered to be essential and suitable for consideration at the Conference. He believed that similar work was being done in France, and observations had already been received from America and Scandinavia. He doubted whether it was possible for the Health Committee to get much further with the preparations for the decennial Conference until the principal countries had submitted their considered views.

He thought that the next stage, after these views had been obtained, would be, not to set up a standing Committee of experts but to convene a small preliminary Conference to consider the suggestions of the Governments and to draw up suggestions for the Conference which would deal finally with the question. He would suggest that the International Institute of Statistics might be invited to nominate half the members of the preliminary Conference.

Dr. RAJCHMAN believed that it was necessary to divide the question into two parts :

(1) International List and relations between the Health Committee and the International Institute of Statistics ;

(2) Utility of appointing a Statistical Committee.

As regarded the list, there was a question of constitutional principle and a question of expediency involved. The position as to the first question was simple. The Health Organisation had decided to have the problem examined, and it was wholly competent to undertake a task of this complexity, at the same time administrative, statistical and medical.

The problem of the collaboration between the Health Committee and the Institute would doubtless frequently arise. He believed that the members of the Committee were unanimous in considering that the method of mixed committees was not the best method. Even with the Institute this method was not very popular, for the very simple reason that the Institute, which was a scientific and technical organisation, had always desired to preserve its independence in face of the Governments and to be able to issue opinions which would be purely scientific and uninfluenced by administrative considerations, whereas, acting with a mixed committee, it would be difficult for the Institute to delimit its responsibilities. He thought that the Health Committee could, on its side, consider problems involving direct communications between the Governments, as being entirely within its own domain, and that it would take the view that, in such a matter, it was impossible for it to act through another body.

To sum up, the Institute desired to preserve its purely scientific character, and the Health Committee to continue its rôle as an organ of collaboration and co-ordination between Governments.

The President of the International Institute of Statistics considered that there were disadvantages in the proposals made to it by the President of the Health Committee and the Medical Director. It therefore seemed that the solution suggested by Sir George Buchanan would be the best, as it would enable them to avoid the appointment of a mixed committee, while it would leave room for an effective collaboration. According to Sir George Buchanan, the complexity of the problem would necessitate its study by national committees composed of various elements, in order that the different parties interested might be included. The question of how these elements were to be grouped was a delicate one. It was evidently preferable to leave the composition of the committee to the responsibility of each of the countries. Following the example of Great Britain, each country might appoint a national committee. When there were a sufficient number of such committees, the essential task of the Health Committee would begin, and would consist in co-ordinating the technical work, in keeping each national committee in touch with what was being done by the others, and in endeavouring not to standardise the enquiries but to co-ordinate the views. After some preparatory work, a preliminary conference might be assembled, to which the Institute would be invited to send such representatives as it thought fit.

As regarded the Committee of experts to be appointed by the Health Committee, two somewhat different questions arose :

(1) Statistical enquiries of a scientific or methodological character. The best illustration of enquiries of this kind was the work of the Statistical Committee attached to the Cancer Commission ;

(2) Statistical questions of a purely administrative character, such as the registration of deaths, etc. All these questions were questions with which the Health Committee had often to deal, and which were entirely different from the first class of questions.

He was entirely in agreement with Sir George Buchanan that it would be very difficult to appoint a standing committee. It would, first of all, be necessary to resort to the competent experts in the various fields, as, for example, Dr. Greenwood, reserving full freedom concerning the choice of persons as well as of the questions to be studied.

For the second group of questions, would it not be very useful to have a standing committee representing the principal statistical bureaux ? The reason for this was simple. The Health Committee frequently had to study these questions of an administrative kind, and this would arise more and more frequently. It was necessary to avoid presenting a report which would not be acceptable to the majority of the principal countries, as in this case the work would be thrown away and the principal object, which was to introduce uniformity in statistics, would not be achieved. The suggestion made to the Committee was the result of the experience of five years. The suggestion was that a Committee should be appointed of five or six members, representing the directors of the statistical bureaux. It should include an American member, an English member, a French member, a German member and an Italian member.

This Committee would be presided over by a highly qualified person, such as Professor Westergaard. It would meet from time to time, as, for example, the Conference on questions of standardisation met, in order to examine the work which had been done, to do some work itself, and to submit to the Health Committee a report and recommendations. A previous examination by this small Committee would enable the Health Committee to judge whether or not it was advisable to proceed with an examination of the question.

How was this preparatory work to be done ? It would be advisable to adopt the method which had been shown by experience to be effective, namely, to entrust this work to the Health Section, which would at its discretion obtain the assistance of a specialist outside.

He was glad that the Committee had approved the work of his collaborators. This work might be continued in the same way as hitherto. The preparatory studies made, either by the Health Section, or by the Health Section in collaboration with an expert outside, or by an expert alone if the question were of a special character, would be submitted to the examination of a group constituted by the directors of the statistical bureaux of the principal countries, to which might be added representatives of some other countries.

As regarded the International List, it would be of advantage to adopt the proposal of Sir George Buchanan and to define it as follows : The Health Committee, by a resolution, would draw the attention of the Governments to the utility of appointing national committees, variously composed, in order to study the problem and to prepare the work of a preliminary conference of the representatives of these committees. The Health Committee would suggest that the Institute should be represented and also participate in the preparatory work.

Professor PITTALUGA thought that the explanations of the Medical Director would be entirely satisfactory to Sir George Buchanan. He would venture to return to the questions which had been raised, particularly by Dr. Lutrario and Professor Jorge, concerning certain deficiencies in the declarations of the causes of death. These questions, to a large extent, involved a problem of medical education and education in diagnosis more than a problem of statistics. It would be necessary to avoid a serious danger. In the desire to modify the list in appearance there was a risk of obtaining the result, contrary to the final object in view, that the doctors, under pressure from the health administrations which desired to obtain more exact declarations, might improvise declarations which did not correspond with their medical convictions. The uncertainties in or lack of declarations would, in appearance, be lessened, but in reality the statistics would be still further falsified. This was not the moment to discuss the question more thoroughly, but it might be useful to mention it in the interests of the future work of the experts.

The PRESIDENT thanked Professor Pittaluga for his observations and asked Dr. Greenwood whether he had any remarks to make.

Dr. GREENWOOD associated himself entirely with the words of the Medical Director. He felt it was his duty to say that the preparatory statistical work done by the Secretariat was in every way remarkable. He was fully of the opinion that it was useless to have a special technical Committee for questions of method. In case of need, it would always be possible to call upon a statistical expert for advice, but it would perhaps be difficult to obtain practical results from a meeting of statisticians. It was preferable to proceed as in the past and to entrust the preparatory work to the Secretariat, with the private assistance of experts who would always be ready to collaborate as best they could. He would especially emphasise the excellent work already done in connection with the very difficult cancer statistics, and would call particular attention to the report concerning those statistics in Japan.

M. VELGHE approved the observations of the Medical Director on the form of the understanding to be established between the Institute and the Health Committee. There was, however, one special point on which he differed, namely, the preparatory Conference. He did not like the idea of convening an international Conference in order to prepare for another international Conference. This preparatory Conference might be replaced by a meeting composed of experts appointed by the Health Committee and of a delegation of the Institute. This procedure would have a twofold advantage :

(1) The work would be easier in a small Committee than in a Conference, which would necessarily include a large number of delegates ;

(2) This solution would doubtless meet the wishes of the Institute, which desired that a Mixed Committee should be appointed.

The Medical Director had emphasised that it was difficult to satisfy the Institute in this particular, but there did not seem to be any objection, when once the work was sufficiently advanced, to calling together for a few days the delegates of the Committee and those of the Institute. Co-operation between the two bodies could not fail to be fruitful and it would be regrettable if they were to work in isolation. It was desirable that, at a suitable moment, the two bodies should get into touch in order to discuss the work done by each of them, examine the proposals to be made and facilitate the work of the Conference. The Conference would have before it simpe and clear proposals concerning the points on which agreement had been reached, and, in respect of the other points, it would be possible to avoid the raising of new and perhaps personal questions.

Before submitting any formal proposal, he would ask the Medical Director and his colleagues to reflect on the observations he had made. These observations were inspired by the wish to obtain an understanding with the International Institute of Statistics.

Sir George BUCHANAN said he agreed with M. Velghe that time should be given for considera-on of the proposals which had been put forward. But he would say at once that he had ot intended to suggest that a large Conference should be called together in order to prepare ie work for the final Conference. He was merely proposing to bring together those who id been dealing with the work in the small number of countries in which the question was ing actively taken up. Their function would be to sort out the items which could usefully taken up as matters for international understanding, to reject proposals which were impracable and to tell the Governments in advance what to consider. The advantage of a small eliminary Conference of this kind was that it would enable those who had been dealing th the work in all its aspects to exchange views. There would be no difficulty as to their lection, as they would naturally be suggested by the administrations to which application as made. It might be possible, as Dr. Rajchman suggested, also to assemble a group merely presenting the chief registration authorities in certain countries. In this case, however, would be necessary strictly to define the terms of reference.

Dr. RAJCHMAN thought that the observations of Sir George Buchanan and M. Velghe uld make it possible to reach a final solution. If the word "meeting" were substituted the word "Conference", and if the invitations were limited to the representatives of certain tional committees, M. Velghe would presumably be satisfied. Secondly, it would perhaps et the views of Sir George Buchanan if the Committee of the Directors of the Statistical reaux were asked to examine the observations of the Governments received by the Secreiat, and to submit their opinions on the subject. Finally, in order to give satisfaction to Institute, a draft resolution might be prepared by a small Committee composed of M. lghe, Sir George Buchanan and Dr. Jitta.

Dr. JITTA associated himself with the observations of M. Velghe and the Medical Director. had never claimed for the Institute the right to prepare a list. He had always considered laboration between the Institute and the Committee to be useful, and he believed that this laboration might be realised by means of the procedure which had been suggested.

M. VELGHE asked that the question should not again be discussed until Professor Léon nard could be present.

THIRD MEETING.

Held on Friday, October 15th, 1926, at 10.30 a.m.

Present : All the members of the Committee, with the exception of Professor Léon nard, Professor Cantacuzène, Dr. Chagas, Surgeon-General Cumming, Dr. Granville Dr. Alice Hamilton.

. Absence of Professor Cantacuzène and Dr. Granville from the Session.

The President welcomed Dr. Raynaud, and read the following telegram which he had ived from Professor Cantacuzène :

"Cordial thanks for good wishes contained in your telegram. Ask you to express to my colleagues my feelings of cordial affection."

He also read a letter from Dr. Granville, who regretted that his state of health would vent him from attending the session. He was sure that his colleagues would authorise to reply to Dr. Granville, thanking him on behalf of the Committee for the valuable which he had given to it and expressing the wish that he would make a prompt very.

Work of the Cancer Commission.

Sir George BUCHANAN, Chairman of the Cancer Commission, read a statement on the accomplished (see Annex 117).

He added that the progress report itself would be distributed shortly to members of the mittee with the relevant papers in an annex. It contained a unanimous and cordial expres-of the thanks of the Commission addressed to Dr. Greenwood, Dr. Deelman, Dr. Wyler, essor Niceforo, Professor Pittard, Professor Pestalozza, and to the other experts, to Dr. anek, Secretary of the Commission, as well as to Major Edge, Secretary to the Submittee of Statisticians. He was sure that the Committee would associate itself with sentiments.

He would point out that, to a very large extent, the task of the Commission was a combina-of the work of national teams which was carried out without cost to the League. The , however, had been rendered possible by subventions from the League of Nations, inting to 30,000 francs last year and 30,000 francs for the current year. The Commission s report emphasised the great value of certain regional investigations regarding cancer h had been carried out in Switzerland under the direction of Dr. Carrière. For these tigations it had been hitherto possible to allow only a very small subsidy, representing urplus of the total grant for 1924 and 1925. These investigations were of such value the Commission ventured to recommend that any available surplus from the 1926 grant ld also be devoted to them.

In conclusion, he mentioned that Dr. Greenwood had submitted a memorandum to the expert Sub-Committee giving personal suggestions as to the way in which a more regular publicity might be assured for the work done in respect of cancer. Copies of this memorandum, he understood, had been distributed some time ago to all the members of the Committee. As the problem of publicity was of interest in connection with all the questions dealt with by the Health Committee, the Cancer Commission had abstained from making any observations on it.

The President thanked the Chairman of the Cancer Commission and the experts who had assisted in the work. He observed that the original programme was almost finished, and noted with satisfaction that a programme of enquiry would be drawn up for the future.

Dr. MIMBELA desired to associate his thanks with those of the President. He would like to know whether the Commission was in touch with the Imperial Cancer Research Institute in England. Moreover, Professors Schauta and Wertheim had instituted, in their hospital at Vienna, certain operative methods which had convinced all those who had knowledge of them. Finally, he would emphasise that he himself had noted extraordinary results obtained by deep radiotherapy in cancer of the breast.

Dr. JITTA said he would also like to pay a very sincere tribute to Sir George Buchanan. The members of the Cancer Commission were extremely grateful to him for the work which he had done in co-ordinating the various elements involved, and particularly for the perseverance which he had shown in inspiring with confidence and optimism those who had seemed inclined to hesitate in view of the difficulty of the task.

Dr. CARRIÈRE reminded the Committee that one of the definite objects of the Cancer Commission was to ascertain the authenticity of the regional differences in the mortality arising from cancer. The work done had shown very precisely that those differences in fact existed, and this in itself was a positive result. The cause of this difference, however, was not yet discovered. An endeavour had been made to explain it by racial variation, but the researches had ended in negative results. Nevertheless, attention had been drawn to facts of an exceptional interest and importance, and he would take this occasion to pay a tribute to the remarkable work done by Professors Niceforo and Pittard, which was a valuable contribution to the general knowledge of those who would be able to become acquainted with it.

He would observe that cancer of the digestive system had a still more important significance than cancer of the breast. In his opinion, it was advisable to decide whether it would not be well to continue researches in this direction and to see whether it would not be possible for the investigations which had been undertaken into cancer of the breast and of the uterus to benefit from those researches.

He thanked Sir George Buchanan for having recognised the value of the researches undertaken in Switzerland. He hoped that further financial assistance could be given.

Dr. TSURUMI congratulated Sir George Buchanan. He had, as usual, presented an excellent report, which was a valuable proof of the progress made by the Cancer Commission. He was happy to learn that the communication of Dr. Kusama on the statistics of the mortality of this disease in Japan had been regarded as a valuable contribution to the work of the Cancer Commission.

He would draw special attention in the report of Dr. Kusama to the relation of the mortality from cancer as between men and women.

As would be seen, mortality due to cancer of the digestive organs, including the liver, was much higher among men than among women. If, however, account were taken of mortality from cancer of the genital organs, it would be seen that mortality among men from cancer of the digestive organs, including the liver, was exactly the same as that due among women to cancer in these same organs as well as in the genital organs.

This very curious fact raised the question whether this relation was exclusively characteristic of his country or whether the same phenomenon existed in other countries. According to the observations of some of the professors of medicine in Japan, mortality from cancer of the digestive tube was greater among drunkards. He hoped that the Cancer Commission would also study this subject.

Finally, he ventured to draw attention to the results of experimental research on cancer in Japan. For example, at the Institute which dealt with nutrition at Tokio, Dr. Fujimaki had succeeded in discovering that the formation of cancer was provoked when white rats were fed on food which did not contain A vitamins. In such cases a tumour was formed in the stomach, which was identical both macroscopically and microscopically with cancer. This experiment had been verified by several Japanese investigators.

He thought it would be interesting to make experiments of the same kind in other countries.

Dr. LUTRARIO also thanked the Chairman of the Cancer Commission very warmly ; his tact, knowledge and confidence had enabled all his colleagues to persevere in a task which was somewhat arduous. The Italian group had not been able at the last moment to procure all the necessary documents, but its report was the first which had dealt with future prospects, all the previous reports having been merely retrospective. They had been based on pre-existing material which had not been specially prepared for the purposes of the enquiry.

The Italian report, although provisional, was composed of a general portion (Professor Giardina) and a special portion which included three investigations : the demographic investigation, which covered 12,323 cases of death by cancer ; the hospital investigation, which dealt with nearly 1,000 cases ; and the anatomical and pathological investigation, which

was based on 686 autopsies made in seven anatomical and pathological institutes of the country. There had collaborated in this enquiry : Professor Niceforo on the demographic side, Professor Pestalozza for cancer of the uterus, Professor Fichera for cancer of the breast and Professor Dionisi for the anatomical and pathological aspect.

The demographic enquiry might be divided into three groups of cases. There were 1,475 cases of cancer of the breast, 2,463 cases of cancer of the uterus, and 8,385 cases of other forms of cancer. It was not the purpose of the demographic enquiry to study the relative frequency of cancer. It aimed, on the contrary, at studying the internal nature of the phenomenon, with a view, if possible, to determining its causes as well as the systems of treatment and their results. The demographic report of Professor Niceforo dealt with age, civil status, profession, previous pathological facts, effect of wounds, chronic irritations, scars, and duration of the disease, the progress of which was sometimes more rapid than was generally believed. Nearly 25 per cent of the cases, particularly in cancer of the uterus, developed in between six and twelve months, and many very rapid cases had been noted which had developed in less than six months. The report also examined changes in the seat of the disease, relapses, surgical operations, radioscopical and radiotherapeutical methods of cure and the influences due to heredity, together with abuses of feeding, alcohol and tobacco.

As regarded the hospital enquiry, the report of Professor Pestalozza dealt particularly with cancer of the uterus. This report contained extremely interesting data on the frequency of cancer in relation to civil status. Unmarried women, for example, were much less frequently attacked by cancer of the uterus than married women and widows : only 10 per cent. This relative immunity existed also for other cancers, which perhaps justified the conclusion that the predisposition to cancer caused by married life and maternity did not appear only in respect of the uterus, owing to local modifications, but might also appear in a general predisposition arising from the modifications which married life and maternity occasioned throughout the whole organism, probably in relation with the endocrine function which underwent modifications (Fichera).

As compared with cancer of the body of the uterus itself, cancer of the cervix showed an extremely high prevalence and this cancer began from the margin of the external os. Dr. Lutrario here gave some very interesting explanations on the alternation of the mucous membranes in this place in order to explain the localisation of the tumour which appeared to begin as an epithelial metaplasia. Childbirth greatly increased the manifestation of epithelial metaplasia, and, therefore, increased the predisposition to the autonomous and disorderly development of epithelial cells. Such growths might be caused by one single childbirth, according to the experience of Professor Pestalozza.

The results of the anatomical and pathological enquiry also appeared to be interesting. This enquiry had enabled a scale to be drawn up of the frequency of the localisations which, to some extent, was very near the scale established by Bojach, quoted by Best in his very recent treatise on the general pathology of malignant tumours. The Italian scale, however, had an advantage which was lacking in that of Bojach, in that it dealt separately with tumours of the nerve centres and of the organs of sense which occupied the fourth place, whereas in the Bojach scale they were indistinguishable from the other localisations.

The light thrown by this enquiry on the verification of hospital diagnoses was fairly important. As regards women, out of 208 cases diagnosed as cancer in the hospital, only 122 cases were confirmed by the post-mortem examination in the first place and then by a subsequent histological examination. As regards men, out of 266 cases of cancer diagnosed in hospital, post-mortem examination and the subsequent histological examination gave as a final positive result only 175 cases. This proved the difficulties of diagnoses, on the one hand, and the excess errors, on the other hand, which invalidated statistics based exclusively on hospital diagnoses.

Possibly this excess in the number of cases declared might compensate for the number of other cases which passed unobserved, and the diagnosis of which was recorded under the loose denomination of "senile decay" or some other similar expression. The question needed to be thoroughly investigated.

He would point out, in conclusion, that, if the light thrown by the observations made was feeble, those observations gave, on the other hand, fairly important guiding rules which would enable the campaign against this formidable disease to be prosecuted.

Everywhere it was noted that patients resorted to the hospitals when the disease was so far advanced that there was not very much hope of a cure. It was necessary to create among patients a new disposition which would urge them to come for treatment as soon as the first symptoms appeared.

Italy, thanks to the national Government, had made progress by means of various initiatives :

(1) A national federation for the campaign against cancer had been constituted ;

(2) A national institute for the study of cancer had been set up. This institute was liberally endowed, and was already under construction at Milan ;

(3) A decree had just been promulgated whereby a fairly considerable credit would be placed on the budget of the Ministry for the Interior ; this action had been taken on the happy initiative of the Minister himself, M. Federzoni. The object of this credit was to encourage the establishment of centres for an early diagnosis of the disease and for purposes of propaganda.

The PRESIDENT thanked Dr. Lutrario for his statement, and congratulated the Italian Government on the efforts made in the struggle against cancer.

Professor PITTALUGA said that the work of the Cancer Commission was one of the most interesting tasks of the Health Committee. He wondered whether the time had not now come to get into touch with the centres of investigation created in the various countries, especially with the special institutes for the study of cancer, each of which might help, with the local administrative and scientific means at their disposal, to assist in obtaining the necessary information.

Dr. CARRIÈRE insisted on the value of the researches of Professor Fujimaki, to which Dr. Tsurumi had drawn attention. Personally, he had noted in his laboratory that rats which were fed on substances devoid of vitamines were attacked, at the end of a certain time, by hypertrophy of the thyroid gland, accompanied by hæmorrhage. He knew how prudent it was necessary to be before applying to men the results of experiments made on rats. He would merely draw attention to the fact and raise the question whether there existed any connection between those two kinds of research.

In drawing attention to certain galloping forms of cancer, Dr. Lutrario was presumably reckoning the period of less than six months from the moment at which the first observations were made.

Dr. LUTRARIO said that the period of six months had been established from the moment when, according to the patient, the first symptoms had been felt. He had seen several cases of cancer among intelligent persons, who had caused themselves to be examined at the beginning and in whom the disease had developed rapidly, in five or six months.

Sir George BUCHANAN thanked the President and his colleagues for their encouragement to the Commission as well as to the experts and national groups whose work the Commission had co-ordinated.

He would refer to the suggestions made in regard to the possibility of presenting a complete summary of the work done up to that moment. One way of doing this would be to prepare a summary which could be incorporated in Dr. Rajchman's next annual report. As, however, it would be rather long, a special summary might be prepared, on the completion of the present working programme, and submitted to the Committee with the proposals for new work. In making such proposals, the Commission should, he thought, take account of the points which Dr. Mimbela, Dr. Carrière and Dr. Tsurumi had just raised. In this connection, he would reply to Dr. Mimbela that close relation with the Imperial Cancer Research Institute in London was already secured through the British National Committee. As regards the results normally obtained by the ordinary modern surgical operations in cases of cancer of the breast, the information collected in the three countries was practically identical. In over ninety cases out of a hundred of early operation, there had been no sign of recurrence after five years' observation. This represented a success which was not always fully realised by the surgeons themselves and of which it was advisable to inform public opinion.

As regards radiotherapy, one of the annexes to the progress report would give a summary of analyses made by Dr. Lane-Claypon for the British Ministry of Health regarding the results of superficial and deep radium treatment on cancer of the uterus. The results of deep radiotherapy were almost as encouraging as those which the surgeons had obtained in cancer of the breast, but there was the important difference that radiotherapy required an extreme degree of specialisation.

Finally, he thought that the Cancer Commission, in carrying out its programme, should take account of the suggestion made by Professor Pittaluga in regard to contact with other national institutes and administrations dealing with cancer. He would like to see some of these institutes or administrations taking the initiative and presenting to the Commission questions which could only be dealt with by pre-arranged international study.

248. Question of Publicity for the Work of the Health Organisation.

Dr. GREENWOOD, on the invitation of the President, observed that, in a report which was intended solely for a Sub-Commission, it was not possible to raise a general discussion on publicity. He would refer only to that part of the report which was of special interest to himself. At the end of the report reference was made to university publicity, and it was noted that even cultivated circles were ignorant of the interesting work which had been done. Thus, more than twenty years ago Professor Alsted had published the results obtained by his operation, stating that early treatment would enable 75 per cent of cases of cancer among women to be cured. That proportion was now certainly well below the truth. It had been noted in England that even professional surgeons remained extremely prudent.

If a close relation were established between the League of Nations and young doctors, perhaps it would be possible to centralise and to spread a knowledge of all the interesting data. In England, however, there were few young doctors who were interested in statistics, and unfortunately there existed a complete separation between the work of the statisticians and the work of the doctors. It was necessary to excite the interest of the young doctors in this work of analysis and to raise the general level of medical education, beginning with a methodical distribution among the university professors of documents on the work of the technical Commissions. Three professors of the University of Geneva had informed him that, if the German *Seminar* system were employed, it would be possible to increase the knowledge of the doctors and to encourage a continuous interest in the researches undertaken by the Health Organisation.

Dr. RAJCHMAN said that it was extremely difficult to effect a wide distribution of the documents on the work of the Health Organisation. At the beginning, the distribution of documents had been organised on the assumption that the Health Organisation of the League was unknown and that it should therefore endeavour to secure a wide and gratuitous publicity. A list of addresses had been drawn up with the assistance of the members of the Health Committee, each for his own country. This list was at present divided into nine sections: the members of the Health Committee; the members of the Permanent Committee of the Office international d'hygiène publique (30 addresses); the health administrations of the various countries (60); the health administrations of colonies and dependencies (70); medical officers of health in large towns (91); research institutes and Government laboratories (43); universities and medical schools (237); certain medical societies for scientific research (29); and the principal medical reviews (99). In addition, there was a section containing the addresses of certain individuals. Publications of general importance were sent to all those on the list; those of a particular interest only to certain sections. Further, a detailed and complete analysis of the publications issued by the Health Organisation was available in printed form.

Doubtless this system of distribution was inadequate, the more so as great importance was very seldom attached to gratuitous publications. Publicity was indispensable. The only possible publicity was that of the medical reviews, but these were so technical that, in the majority of cases, there was a danger of organising too wide a publicity, and it was necessary to choose with the greatest care such of the work which lent itself to publicity. The only way to do this was to rely on the good will of the members of the Health Committee and of the experts, counting on them to ensure this publicity in their respective countries. It was necessary at once to obtain regular and automatic methodical analyses of the publications of the League of Nations. The first obvious method would consist in making an agreement in each country with the editors of the medical reviews. He thought that it might be possible to offer manuscripts of these publications to publishers, or at least certain of these publications — for example, the volume of Professors Niceforo and Pittard, for which a publisher could very easily have been found.

Professor OTTOLENGHI said that, if the Committee desired the Press to publish analyses, it was necessary to provide it with the right documents ready-made. At present, the League of Nations sent almost everywhere a *Monthly Summary* of all the work accomplished by its services, in which the work of the Health Organisation occupied a limited space. This passage from the *Summary* was fairly regularly reproduced in full in the Italian medical Press and sometimes in the political newspapers. He was certain that critical and more detailed analyses, prepared by the members of the Committee, would be very useful, but he knew from experience that there was often not enough time to write them with the necessary regularity.

The PRESIDENT wondered whether it would not be equally useful to make a summary of the work done during the sessions of the Health Committee. He proposed to entrust the whole question of publicity to the Medical Director.

Dr. RAYNAUD said that, in collaboration with Professor Léon Bernard, he had published on several occasions, in the medical Press and the health reviews, notes on the work of the Health Committee. Would it not be possible for the Secretariat to prepare at the end of each session a short analysis of the work accomplished, which might be translated into several languages and communicated to all the important journals of each country?

Dr. RAJCHMAN observed that the Information Section gave to the agencies a daily communication during the session. Further, journalists accredited to the League of Nations willingly came for documents in the intervals between the meetings of the Council and the Assembly, but it was extremely difficult to choose subjects likely to interest world public opinion among matters of a very pronounced technical character. He would willingly consent to establish an informal summary of the work done at each session, but, in his opinion, it was preferable for each of the members of the Committee to undertake himself to draw up a summary which would be of a more vital and personal character.

Sir George BUCHANAN agreed with the Medical Director. It was necessary, however, to have a single and authoritative document recording the work done during the sessions, otherwise misunderstandings and regrettable contradictions would arise. It was desirable, no doubt, to consider if better means could be found to bring the expert work of the Committee to the notice of the medical public and to sell more volumes. But it was an old complaint that official publications did not have much sale.

Dr. JITTA said that, when he returned to Holland, he regularly published a summary of the work done during the session and of the report submitted by Dr. Rajchman. This was a fairly considerable task, however brief the summary might be. In his opinion, each of the members of the Committee should get into touch in his own country with a young doctor to communicate to him all the documents which might be of use in drawing up a brief summary.

The PRESIDENT said he agreed with Dr. Rajchman and Sir George Buchanan on the uselessness and the disadvantages of publishing different documents on the work of each session. In his opinion, each of the members of the Committee should, with the help of the Secretariat, extract from the minutes such matter as would be likely to interest particularly the medical profession of his country. He would, for example, select the creation of a bureau at Singapore and the establishment by the Health Organisation of a standard for insulin as facts of extreme importance which had for the most part passed unnoticed.

Dr. CHODZKO observed that the best way of getting into touch with the public was to give interviews to the principal newspapers on certain subjects which were likely to interest it. As to the medical public, he thought it should be the duty of the Chairman of the Commissions of the Health Committee to give accounts of their work both in the medical journals and before the medical societies.

Dr. RAJCHMAN said he would, at the next session of the Committee, submit a general scheme of publicity, including a detailed analysis arranged according to subjects, and that he would examine the scheme with each of the members of the Health Committee in order to ascertain what was the best method of organising the necessary publicity in his country.

FOURTH MEETING.

Held on Friday, October 15th, 1926, at 3.30 p.m.

Present : All the members of the Committee with the exception of Professor Léon Bernard, Professor Cantacuzène, Dr. Chagas, Surgeon-General Cumming, Dr. Granville and Dr. Alice Hamilton.

249. Epidemiological Information : Possibilities and Advantages of the Creation of a Centre of Epidemiological Information for the African Continent with its Provisional Seat at Algiers : Report by Dr. Raynaud.

Dr. RAYNAUD introduced his report (Annex 110).

After giving a history of the conditions under which the Health Committee had taken up the question, he emphasised the inadequacy of the information of an epidemiological character which at present reached the various health administrations of Africa, each of which generally speaking, was unaware of what was happening in the neighbouring countries. He next gave, with the help of maps, information concerning the land, sea and air communications and facilities for communication by cable or by wireless which made Algiers one of the principal centres in Northern Africa.

Air Communications. — Regular services connected Algeria with France and Spain and communications were now established with the south.

Wireless. — Wireless posts were established at each station where aeroplanes landed, and others were scattered throughout Southern Algeria. Last June, certain difficulties had been raised at a meeting of the Health Committee in regard to the reception of wireless messages principally due to atmospheric disturbances. The multiplication of powerful stations, such as were found at Bamako and at Dakar, etc., would necessitate a staff of experts and considerable expenditure. It was nevertheless possible to improve the present system, which would at once enable Algiers to communicate with certain of the principal stations of Western Africa; attention should, however, be drawn to the interesting investigations at present in progress in wireless telephony by the use of short wave-lengths. This method, which enables Marseilles to communicate easily with Madagascar, was not very expensive and opened up interesting prospects.

Cables. — Algeria was connected with Europe by some ten cables. In addition, a English cable ran from Bone towards East Africa. There existed a series of cables along the western coast of Africa and an important land system.

Automobile Services. — Several companies were running automobile services connecting across the Sahara, Southern Algeria with Western and Tropical Africa. Routes had been constructed and were kept in good condition in connection with watering places, and in some districts with hotels, and the security of these routes was assured.

To sum up, thanks to the various systems of communication now existing, the Sahara did not any longer separate Northern Africa from Western Africa, but united the two regions.

Epidemiological Position. — Dr. Raynaud then made certain observations on the progress of various epidemic diseases, which not only accompanied the migrations of the natives but were also penetrating the interior of the country from the coast as the country was opened up to civilisation.

Relapsing Fever. — A very important problem was involved, namely, the transmission by lice of an infection which did not previously exist and which ran the risk of further extension.

Plague. — Cases of plague accompanied the trade from Morocco towards Dakar, and plague had penetrated to the interior.

Yellow Fever. — Endemic centres of this disease existed in Western Africa, and yellow fever seemed to follow the course of the Niger. The natives were not affected but constituted centres of virulent infection.

Malaria. — Malaria was present in Western Africa and to some extent in the north.

Tuberculosis. — Tuberculosis had been introduced into Africa by the Europeans.

Sleeping-Sickness. — The Committee had been furnished with an interesting report on this disease.

Cerebro-spinal Meningitis. — This disease had entered from the coast and had spread to the various States of Western and Equatorial Africa.

Generally speaking, it should be noted that each of the territories of Western, Equatorial and Northern Africa was too much in ignorance of what was happening in the others, and was not safe from infection which might pass from one region to another. Without dictating to the administrations concerned what they should do, it seemed that the object of an organisation like the Health Organisation should be to spread in these districts certain ideas and to urge the various administrations to keep themselves mutually informed of what was happening and of the steps which were being taken. Africa could not, alone among all the continents, be left without any organisation for purposes of information such as would place at its disposal the resources enjoyed by the Health Organisation.

At the conference in Freetown, which had concluded the interchange of health officers n Western Africa, various suggestions had been put forward as to the site of the centre of epidemiological information which might be created. It appeared that the British Colonial administrations, which were at first opposed to the French suggestion, were beginning to realise he advantages which were inherent in it. He would point out that his colleague at Dakar had received requests for information from the British side, and Dakar was now exchanging nformation with the English colonies in that region.

This was a very important indication, as it showed that special agreements were beginning o be established between the various States of Western Africa. It was advisable to encourage uch agreements.

Dr. Raynaud next gave some information on the present organisation of epidemiological nformation between Tunis, Morocco and Algeria, of which Algeria was the centre, and he rew special attention to the health bulletin of Algeria. Recently a liaison had been established etween Algeria and Egypt. It was clear that the present organisation in Northern and Western Africa, which was wholly private in character, could not fail to benefit from the upport and the facilities which the League of Nations might give. With the credits which ight be put at their disposal, the various Governments would be in a position to begin the ublication of bulletins and to send telegrams in cases of serious infection.

In regard to the experiment which he had been asked in June of last year to undertake, he ould explain that, during the whole of the summer, owing to the absence of the principal epresentatives of the administrations concerned, he had not been able to obtain the informa- on which would have enabled him to fulfil this part of the task with which he had been entrus- d by the Committee. It was only now that this consultation could take place. The ques- on was whether the Committee still considered that it was advisable to make an experiment. so, would Algiers be kept as the centre or would another seat be chosen ? Whatever might the decision of the Health Committee, it was certain that the future organisation must be ternational, and it would be necessary for the various nationalities represented in Africa be able to delegate members. His duties would not enable him personally to assume the rection of such a service. If it were desired to create a system involving not only an exchange epidemiological information, like the Bureau at Singapore, but also a study of tropical diseases, cording to the suggestion put forward last June, a supplementary staff would be indispensable.

The PRESIDENT, on behalf of his colleagues, thanked Dr. Raynaud for his statement and his documents, which would provide a valuable basis for future discussions. He also ngratulated the various French administrations on the work they had done and on the ults which had already been obtained.

Professor PITTALUGA thought it would be only right to examine in some detail the question alt with by Dr. Raynaud, not only because he had been in South America and it had been possible for him to be present at the June session, but also because of his personal knowledge of African Continent and of the interests of Spain on the coast and in the western islands of Africa.

It would be noted that all those who had considered the necessity of co-ordinating epi- niological information for the African Continent started from a common principle, namely, t an organisation should be founded for the great geographical entity represented by the stern coast of Africa. This was the point of departure for the decision taken by the Assem- in 1925, and this same idea had inspired the debates and the conclusions at Freetown, well as the replies of the majority of the Governments which had been consulted. Only Belgian Congo and the Government of South Africa had contemplated a Pan-African eau. The Committee had decided last June to study the possibility of creating a Pan- ican information bureau provisionally established at Algiers. If he had been present, he uld have insisted that the Bureau should be limited to Western Africa.

Though a reading of the minutes of the seventh session and the report and statement of Raynaud had possibly modified his views, there nevertheless remained the undeniable that Africa consisted of at least five great geographical entities, which were quite distinct :

Northern Africa, consisting of Morocco, Algeria, Tunis, Tripoli and Cirenaica.

Eastern Africa, which included the valley of the Nile, the Great Lakes, and the valley of the Zambesi ;

Western Africa, bounded on the north by the Gambia and the Niger, and including the great rivers of the west ;

South Africa, which was not only a geographical entity but which also had a certain political and social unity ;

Finally, there was Central Africa, which would perhaps disappear as a separate entity when the adjacent regions were organised.

These different regions were distinguished, from the racial point of view, by the development of their civilisation and the degree of intervention by Europeans. It would be necessary at the outset for each of these five great divisions to be organised as a separate unit for the purposes of epidemiological and health information before it was possible to contemplate an organisation which would assemble the data for Africa as a whole.

This conception of an Africa divided into five great regions might serve as the basis for the programme of work of the future provisional bureau. This programme would consist in the first instance, in encouraging and organising the formation of subsidiary centres, which might give reality to the organisation of a service of epidemiological information in Africa.

The statement of Dr. Raynaud clearly showed not only the importance of the health problem of Africa but also that Algiers was an important nucleus and a great centre of communications ; but though Algiers, owing to its position, was suitable as a centre for important epidemiological observations, it did not necessarily follow that this city should be the final seat of the epidemiological information bureau for the whole of Africa. The statement of Dr. Raynaud had shown the extent and urgency of the problem and how important it was for the present Health Committee to leave precise indications on this subject for the benefit of the Committee which would succeed it next year. The statement had not, however, shown either that the seat of the bureau should be Algiers or that this bureau should be Pan-African.

Nevertheless, he would perhaps be able to support the proposal at present before the Committee, which would be more precisely defined by the limitations and directions to be imposed by the Committee on the organisers and by the various views which might be put forward during the discussion. The creation of a provisional site in any other place presented at least as much difficulty as its creation at Algiers. In particular — and this was a consideration which should inspire the establishment of the programme of the future provisional bureau — this city was the centre of co-ordination not between the various regions of Africa but between a large part of Northern Africa and the Mediterranean basin. It was that which made it really important.

At the June session, it had been proposed to create a centre not only of epidemiological information but also of scientific study. The Health Committee had so many questions of a practical character to settle that it would not be possible to embark anywhere in Africa upon a study of all the African diseases. Even though account were taken of the important institutions existing at Algiers it would be necessary, if it were desired to set on foot work worthy of the high aims of the League of Nations, to make an effort beyond its present resources at least from the budgetary point of view. The plan would have to be confined to establishing a provisional bureau instructed to examine, within a period to be determined, the possibility of creating an epidemiological information bureau principally for Northern and Western Africa, these being the only two parts of Africa which could at once be more or less connected with each other.

The report of Dr. Raynaud had provided information almost entirely concerning the French organisations. The Committee, however, had to undertake international work, and it was necessary to ascertain the facts in regard to the other nations.

The limitation of the efforts to Northern and Western Africa was also a necessary consequence of the limitation of the means at the disposal of the Committee. The organiser of the provisional bureau would have a great deal to do in establishing relations with the fifteen or twenty Governments of Northern and Western Africa. It was impossible to consider Eastern and South Africa, where there already existed scientific and health organisations. Nor was it possible to consider Central Africa or a portion of Eastern Africa which was still partially unknown. The future bureau should encourage the creation of other centres of information within the great geographical units which he had already indicated, endeavouring to make these geographical units coincide with certain political units. From this point of view, perhaps, Tangiers would have seemed to be specially suitable owing to its international position.

To sum up, the work of the bureau would be limited to Northern and Western Africa and would deal strictly with epidemiological information, all scientific research being at the moment eliminated. Only thus would it be possible to collect and to sift precise information on the spot. Finally, one of the essential tasks of the bureau would consist in studying and establishing, according to the methods and the procedure which it considered desirable, epidemiological relations between Africa and the Mediterranean countries. Under these circumstances, and with these reservations, he could associate himself with the views adopted at the June session and with the report of Dr. Raynaud.

He would add that he was authorised to abandon the very vague suggestion with regard to Monrovia (Liberia) as a seat of the bureau, and to accept provisionally Algiers, where the personality of his colleague Dr. Raynaud ensured in advance excellent results.

M. Velghe feared that some of the observations of Professor Pittaluga had somewhat disconcerted the Committee. Doubtless his colleague was right in recommending the Committee not to go too fast and to limit the work at the beginning. It was necessary, however, not to block future perspectives. The Belgian Congo had asked that the bureau should become a Pan-African bureau. The resolution which would be adopted should place no obstacle in the way of the bureau eventually becoming a Pan-African bureau. The bureau at Algiers should be able to receive and even to solicit assistance. One of its principal tasks would be to induce all the health administrations of Africa, if not to arrive at an immediate arrangement, at least to facilitate a general agreement. Personally, he hoped that one day the bureau would be constituted for the whole of Africa, the question of its final seat being left on one side, to be settled according to the proposals submitted and the necessities of the case.

As regarded the scientific development to be given to the future bureau, Professor Pittaluga had rightly emphasised the difficulty of organising a scientific institute at Algiers for the study of tropical diseases. Events, however, would not move in this way, and such was not the sense of the discussions of last June. The consideration to be kept in mind was that Algiers was well situated between Europe and Africa to serve as a link between the two continents and to facilitate and prepare investigations. It was certain that these investigations would have to be made on the spot so far as the majority of the tropical diseases was concerned. Besides these researches made on the spot, however, an institute might be contemplated for purposes of liaison and information, which would be able to follow the enquiries undertaken and to facilitate discussions of the same kind as those which took place in the Health Committee itself, without its having to move from its headquarters. The bureau at Algiers might also assist in many ways the missions which would be sent into the interior. Being near to Europe, it would be able to place itself at the disposal of the European Governments which desired to organise missions in Tropical Africa, and it would be able regularly to inform the Committee at Geneva of what was being done. He would be glad to hear from Dr. Raynaud his ideas on the organisation of the service which would be created at Algiers.

Professor JORGE said he was glad to place at the disposal of the Medical Director a collection of fifty photographs taken by the Portuguese medical officers who had participated in the West African interchange, together with an annotated map.

Although the Portuguese Government considered that Dakar would be the best centre for the future bureau, the Health Committee had in June last taken a different decision and, in conformity with the suggestions of the majority, the participants in the West African interchange had decided in favour of a Pan-African bureau. There were several possible solutions of the problem, all quite legitimate, and other solutions might be imagined than those formulated by Dr. Raynaud and Professor Pittaluga. Personally, he had recently expressed the opinion that Africa might be divided into three districts on the basis of their maritime relations. These were : the Mediterranean region, with Algiers for a centre ; the Atlantic region, of which the centre might be Dakar ; and the Eastern and Pacific regions, which were already more or less connected with Singapore.

There was, in any case, one essential consideration to be kept in mind, namely, that Central Africa constituted a very important centre from the pathological point of view, and Africa could not be divided into several regions for reasons of a pathological character. The eastern and western colonies of Portugal in Africa had, for example, almost the same pathological system. One factor which should not be forgotten was the migration of the natives, which was particularly active in Western Africa so far as agricultural work was concerned, and towards Eastern Africa so far as the miners were concerned. This movement of population encouraged the propagation of disease.

Doubtless it was impossible to do everything at the start. It would be impossible at present to organise Africa into five regions. It was necessary to be content in the beginning with a provisional centre of information, and it was with this idea in mind that he had participated in the decision of last June. He had voted for Algiers essentially because the man best qualified to undertake the work was in that city. The work done in so short a time by Dr. Raynaud was the best guarantee for the Health Committee of what he would be able to do in the months and years to come.

Sir George BUCHANAN said he hesitated to intervene in the discussion, as he was not yet very well informed on the question. He had assented to the proposals made at short notice in June largely for the same reason as Professor Jorge, namely, because he appreciated the qualities of the man who had been entrusted with the preliminary studies. The only information which he had since received on the question was contained in the documents now before the Committee, particularly the report of Dr. Raynaud, with which he had become acquainted only at the moment of his arrival at Geneva. He had not, therefore, had any opportunity of consulting the competent authorities in his country on the subject.

The problem had an immense importance for Great Britain owing to the numerous British possessions in Africa. The suggestions put forward at Freetown for a West African bureau had been discussed by the British Colonial Office with the various colonial administrations, whose replies had been in the negative. It was necessary, in passing, to emphasise that in Great Britain no pressure was brought to bear by the mother-country on the colonies, and that the mother-country referred such matters to the colonies and to their health experts. The colonial administrations were quite aware of the importance of obtaining information about epidemics and of keeping in touch with the neighbouring administrations. In the unanimous view of these administrations, however, a bureau such as the one proposed would not be practicable.

If this view were taken as regarded a West African bureau, it seemed to apply to the other bureaux suggested. To begin with, there could be no question of the bureau being necessary for co-ordinating scientific research. The place for such a centre was not in Africa but in Europe. Thus, for sleeping-sickness, the Conference to organise the work had met in London and might just as well have been held in Paris or Berlin, where there were important institutes of tropical medicine. Secondly, he was quite unconvinced, from the facts so far given, of the practical utility of a bureau of information for this continent as a whole, or for any special parts of it. He thought that the purposes to be achieved were being obscured by the study of the methods of communication which had been mentioned. He had been much more impressed by the part of Dr. Raynaud's statement concerning agreements between neighbouring administrations. It was extremely advisable that the various administrations concerned should agree among themselves to warn one another in the event of there being danger of an epidemic.

The Committee might do useful work by encouraging greater action in this direction. Co-operation of this kind already existed in part and was tending to improve. It was more important to bring to perfection existing facilities than to try to create a vast and uncertain system of "intelligence" with an embryonic organisation, across immense distances. He would be inclined to favour the appointment of a small and highly qualified committee, with Dr. Raynaud as Chairman or Rapporteur, in order to enquire into the methods of improving co-operation between neighbouring countries. On the other hand, he was not in favour of a Pan-African bureau or even of a bureau for a certain part of Africa. In view of the opinion already expressed by the British colonies in Africa, he would be obliged, as a practical matter, to oppose the idea of establishing, even provisionally, a branch of the Epidemiological Intelligence Service either at Algiers or elsewhere.

Dr. LUTRARIO congratulated Dr. Raynaud on his statement. Personally, he would view with the greatest sympathy the creation of this new centre, but he must reserve his opinion, since the Italian Government, whose important interests in Africa were well known, had not yet taken a decision and had not sent him any instructions. With this reservation, he believed that the new centre should be constituted on the model of the bureau at Singapore, which was well conceived. For this reason, he had been glad to hear Dr. Raynaud say that the various countries should be represented on the proposed body, as this could not fail to develop a spirit of collaboration which should lie at the basis of such an institution.

Although the proposal was to make a limited experiment, he had the impression that the budgetary estimates suggested by Dr. Raynaud in his report were on the moderate side, particularly if the budget of the Bureau at Singapore were considered. It would be difficult for the medical officer who would be at the head of the small proposed organisation to accept a salary of 15,000 French francs. From the outset, the experiment should be of a character to inspire confidence in the proposed object.

Sir George BUCHANAN, completing his previous observations, said that the opinion which he had expressed was given in the present circumstances, and in view of the opinions expressed on the British side after the conference of Freetown. New factors might, of course, appear, which would modify his opinion, but he suggested that, for the moment, it would be well to leave the question on one side and not to take an immediate decision. For this there were two special reasons :

(1) The report of Dr. Raynaud had not yet been examined by the authorities concerned, *e.g.*, in Great Britain, or by the interested British colonial administrations ;

(2) A discussion was about to take place in Paris which might throw light on the advantages of regional bureaux for the purposes of the International Sanitary Convention.

For these two reasons, it would suffice for the Committee to receive and note the report of Dr. Raynaud without any resolution being adopted.

Dr. RAJCHMAN said that he would not speak on the substance of the question which did not come within his province. He would merely remind the Committee of the position so far as the procedure was concerned.

Last year, the Assembly, at its sixth ordinary session, on the initiative of the French delegation, decided that an enquiry should be undertaken on the advisability of setting up for the West Coast of Africa a bureau of epidemiological information similar to the Bureau at Singapore. The Council referred the question to the Health Committee for advice and report. The Health Committee, after a preliminary examination in October 1925, advised the Council in favour of the following procedure :

(1) The Committee, in view of the utility of ascertaining the opinion of the Governments concerned, asked that the Council should authorise the Secretary-General to address a circular letter to the Governments with possessions in Africa. This was actually done.

(2) The Committee recommended that the question should be examined at the final conference of the West African interchange, and that an official of the Health Section, accompanying this interchange, should submit a report on the question.

In June last, the Committee received a provisional report from Dr. Destouches, explaining generally the views expressed in Freetown. The official opinions which came in later agreed with those expressed at Freetown.

The Health Committee had realised the difficulty, even if the principle of the creation of a health bureau were adopted, of choosing a locality or a definite region as the seat of the bureau, owing to the divergence of opinion on this point. The Committee accordingly asked Dr. Raynaud to make a preliminary experiment, so that he might be able to say at the present session whether, on the basis of this experiment, it would be possible to create a provisional centre at Algiers.

The present proposal was therefore the following :

From the opinions hitherto received from the Governments, it appeared that there was a fundamental divergence of view, even in regard to the principle of the proposal. On the other hand, Dr. Raynaud had explained why it had not yet been possible for him to carry out that portion of his instructions which referred to the experiment to be undertaken. As regarded the present report by Dr. Raynaud, it was to be noted that the very important information hitherto collected by him dealt principally with the French territories of Africa. He had not yet been able to obtain equally abundant information for the other African territories. Dr. Raynaud's task, if only for that reason, was not yet completed. Even after he had collected complete information, he would still have to deal with the second and most important part of his task, namely, the practical experiment, and the Health Committee was not yet in a position to give the Council any advice on the proposal which had been referred to it.

Doubtless, as Sir George Buchanan had observed, the whole question of epidemiological nformation, and particularly that of regional bureaux, would be discussed next week at Paris, but it would be discussed by the Office international and not by the Health Committee. The Health Committee had received instructions from the Council to give an opinion. It had ıot yet itself decided to ask its own Advisory Committee for an opinion, and it was for the Health Committee, as constituted, to give to the Council an opinion on the subject.

Moreover, Sir George Buchanan did not think it would serve any useful purpose to collect ndefinite information in regard to widely scattered territory. On the other hand, there ould be a great advantage in obtaining more precise information from the various health dministrations. Sir George Buchanan had noted with satisfaction the exchange of views hich had taken place between the British and French colonies of Western Africa, and was f opinion that it was advisable perhaps to let the matter rest there for the moment. This as a very important observation. Dr. Rajchman thought that one of the essential tasks f the centre to be established, whatever might be its seat, would be to facilitate by every ieans at its disposal exchanges of observations and information of this character. It was ear, moreover, that the exchanges of views and information to which Dr. Raynaud had lluded did not constitute an international system. It merely covered relations between eighbouring health administrations.

He thought that the proposed experiment was all the more indispensable, before the Committee issued a final opinion, since there were divergences of view within the Committee itself s to the portions of Africa with which the bureau would deal. The division suggested by rofessor Pittaluga involved arbitrary limitations. It might be asked whether, when the xperiment began, Dr. Raynaud might not realise that it was necessary rather to consider idemiological divisions according to the indications furnished by experience.

To sum up, it seemed that the procedure required that the Health Committee should ubmit an opinion and that it would be very difficult to do so at the present stage. If the ommittee wished to be able to present a clear recommendation to the Council, it would be rudent to ask Dr. Raynaud whether he would continue his enquiries, make the proposed xperiment, and at the next session submit to the Committee the results obtained.

Professor PITTALUGA, replying to M. Velghe, said he thought, without losing sight of e great ideal at which the efforts of the Committee were aimed, that it was prudent at the ginning to proceed step by step.

Secondly, the Medical Director had shown quite imperatively that the Committee could d must for the moment limit its enquiries to an experiment which was already in the hands Dr. Raynaud.

The question of the future scientific development of the proposed bureau seemed to settled by the observations of M. Velghe. He himself had not meant to say that the results tained and the methods to be followed in collecting and publishing them should not be entific. To some extent there ought perhaps to be scientific commentaries, which might be eful for the guidance of the African administrations which would be in touch with the future ntre. He had merely meant that there could be no idea of a centre of scientific research. is being so, he believed that there was unanimous agreement on this point in the Committee.

The observations of Sir George Buchanan were to be borne in mind in the sense that the estion must not be allowed to drop out of consideration, but the procedure decided upon ould be enabled to achieve its object — in other words, the results of the experiment to be dertaken by Dr. Raynaud should be awaited.

To sum up, Professor Pittaluga thought that all the members of the Committee were ctically in agreement. The bureau of the Committee might be entrusted to prepare a ft resolution. This resolution would be merely a confirmation of the decision of last ne, account being taken of the observations which had been made, and which would be luded in the Minutes as a basis for the future action of the Committee.

The best guarantee rested in the choice of the man appointed to make the experiment ; well-known tact would give the Committee the assurance that, in the execution of his task, ount would be taken of all the various shades of opinion expressed in the discussion which l just taken place.

Dr. RAYNAUD thanked his colleagues for their flattering tribute and said he would like eply to some of their remarks.

As regarded the regional centres, he himself, before drafting his report, had not been ware of the diversity of the regions of Africa. If, however, he had felt it necessary to pose the creation of five or six distinct centres, this would have meant postponing whole question to an indefinite date, and, moreover, he would not in that case have n carrying out his instructions.

He would point out that, after the June session, the Governor of French West Africa, om he had informed of the decisions of the Committee, had assented to the choice of iers as a provisional centre. The letter from M. Audibert (Annex III), which was subsequent his event, showed, however, that the French Government maintained its preference for kar. Even on the French side, therefore, there were still different shades of opinion, and ppeared that France seemed to be in favour of regional organisations. In brief, the ques- was not quite clear, and, as the Medical Director had said, it was advisable to continue investigations.

To the question raised by M. Velghe, he had replied in advance in Chapter XIII of his ort. It was clear that the work to be undertaken at Algiers would not resemble that which done in Europe and elsewhere. In the bulletins which were contemplated, he would ngly see, beside the epidemiological information, information on the organisation of th and health expenditure, accounts of the works which had appeared in Africa, etc.

It would be useful for him to have an assistant to help in analysing all that had been publishe in this way.

He thanked Professor Jorge for his kind words and was glad to see that his Portugues and British colleagues were prepared to support the present scheme if new arguments shoul modify the views of certain Governments. His report and the Minutes of the present discu sion would perhaps contribute to such a change of views.

He was glad that Dr. Lutrario considered that the budgetary estimates suggested in th report were very modest. He would point out that these estimates did not cover the salar of, but an allowance for, the medical officer whose assistance would be indispensable to hir Without being able to assume the whole burden of the work, he would be in a position t supervise it and to give directions.

The observations of the Medical Director seemed to him very judicious. If the Committe agreed, he would willingly consent to carry out the proposed experiment. He would as for provisional credits to enable him to have an assistant, and he would agree with the burea of the Committee as to the amount which might be made available.

Sir George BUCHANAN said that he largely agreed with the Medical Director. He woul however, like to be clear as to what was understood by "continuing the experiment Experience in the Health Committee had often shown that the time to take a decisio was when a proposal was represented as provisional or temporary, and not later on. Fo this reason, it was well to be clear as to what it was proposed to do. The experiment migh be contemplated in two different ways :

(1) It might consist in studying the possibility of creating for Africa a provisiona branch of the Epidemiological Information Service. In this case, the representative of th Committee, on behalf of the League of Nations and with the authority of the Committe would enter into the necessary relations with the health administrations concerned. I that case, it would almost necessarily follow that the enquiry was intended to result, if possibl in the establishment of a branch bureau of epidemiological information, receiving subsidi from certain countries, from the Assembly and from the Rockefeller Foundation.

(2) A simpler solution, in order to meet the wishes expressed by his colleagues, an one which could more easily be accepted, was that Dr. Raynaud should be asked to continu as Rapporteur of the Committee for this question. As Rapporteur, he could obtain informa tion from other health administrations in order to place it before the Committee. As Rap porteur also, he would receive a subsidy for the necessary extra work involved in his own office a Algiers, to be carried out by his own staff, for which he, and not the League of Nations, woul be responsible. There would be no question of his office being experimentally termed a pro visional branch epidemiological bureau of the League. There would be no decision taken t establish, even provisionally, an African bureau or any other intelligence bureau at Algier He could associate himself with this second interpretation, but he was sure that a more amb tious enterprise would call forth serious objections.

Dr. RAJCHMAN said he was entirely in agreement with the spirit of the second solutio suggested by Sir George Buchanan, which was, moreover, in conformity with the June dec sions, and he thought that Dr. Raynaud would also be in agreement with it. It was in n way proposed to prejudge at this moment the question of any particular bureau or any pa ticular locality but merely to make a practical experiment. He would make one reservatio concerning the remarks of Sir George Buchanan. Dr. Raynaud had said that he could no make this experiment with his present staff, and had asked for an assistant, who would remai under his own direction and not under the direction of the League of Nations, in the sam way as a member of the Cancer Commission or the Malaria Commission might ask for the hel of an assistant and the grant of a subsidy.

Dr. RAYNAUD agreed. He was asking that a subsidy should be granted which woul enable him to obtain supplementary staff.

The PRESIDENT said he thought that all his colleagues had agreed to accept the proposa of the Medical Director.

Sir George BUCHANAN asked whether it was proposed that the Committee should adop a resolution on the subject.

Dr. RAJCHMAN suggested that Dr. Raynaud should merely be invited to establis his report in conformity with the June decisions.

Sir George BUCHANAN said that the explanations of the Medical Director as recorded i the Minutes would no doubt be a sufficient indication for Dr. Raynaud.

Dr. RAYNAUD said he thought that a resolution was unnecessary. He would come to a agreement with the bureau of the Health Committee. He would ask his colleagues to acquain their respective administrations with the object pursued and the methods contemplated, i order that the carrying-out of the experiment might be facilitated.

FIFTH MEETING.

Held on Saturday, October 16th, 1926, at 10 a.m.

Present : All the members of the Committee with the exception of Professor Léon Bernard, Professor Cantacuzène, Dr. Chagas, Surgeon-General Cumming, Dr. Granville and Dr. Alice Hamilton.

250. Work of the Malaria Commission.

Dr. LUTRARIO (Chairman of the Malaria Commission) said that the Commission had only just finished its work, so that its report, together with the report of the Drafting Committee on the tour which it had just made, had not yet been completed. He would therefore confine himself to a short summary.

The tour in Sicily had lasted from September 27th to October 7th. The Commission had everywhere met with a cordial and deferential reception, and the local authorities had vied with one another in facilitating its enquiries. The remarkable report of Professor Marchoux had not yet been discussed by the Commission, but, pending discussion, he would like to thank its author very cordially.

Sicily occupied in Italy the third place among districts which were subject to malaria, coming after Sardinia and the Basilicate. Its area was some 25,000 square kilometers and it had 4,200,000 inhabitants. The malaria districts covered 10,000 square kilometers, or about 38 per cent of the island. The causes of this state of affairs were complex, being natural, artificial and social. The territory was fairly mountainous, and the mountain ranges were intersected by narrow and numerous valleys and gorges. The plains were extremely confined, and the trees had been extensively cut down. There were few rivers, and the watercourses were generally in the nature of torrents. Clay and marl predominated and rendered the earth less capable of absorbing moisture and led therefore to stagnant water. The atmospheric precipitations were not abundant, a fact which compelled the farmers to institute a system of open irrigation and to dig canals and basins which became breeding grounds for the mosquitoes. Finally, from the social point of view, Sicily had not until recently enjoyed the progress made in health matters and social well-being to the same extent as the rest of Italy. Major "improvement measures" were inadequate to settle the problem. They could only apply to 36,000 hectares, which was a limited area in comparison with the million hectares subject to malaria. The problem was rather one of minor "improvement measures".

The tour had begun at Palermo with a meeting at the prefecture and a lecture by Professor Manfredi. He had himself given a lecture on the work of the League of Nations and of the Health Committee. The Commission had visited the great reclamation works carried out at Mondello. This spot was covered with large marshes, where the water from the mountains came down and constituted a continuous source of malaria. As a result of the construction of an encircling canal and of important terracing works, not a single case of malaria had been noted for thirty years, and the search for the larvæ of mosquitoes carried out by the members of the Commission had had negative results. For the rural and economic restoration of the land, the military engineers had undertaken important reafforestation works, works for the strengthening of the banks of watercourses and the construction of galleries to act as waters and of canals and artificial lakes. An example of an undertaking on a large scale which had been completely successful was the artificial lake of Piana dei Greci. The waters of the high valley of the Belice, imprisoned by a great dam, at present formed an artificial lake, which was able to furnish from 12,000 to 24,000 kilowatts of electrical energy and nearly 1,000 litres of water per second for irrigation in enclosed pipes. This little river, which formerly was spreading malaria down to its mouth had been transformed into a source of health and prosperity. The luxurious vegetation of orange and lemon-groves justified the name of the "Shell of Gold" which was given to the region watered in part from this lake. The improvements effected along the course of the river Oreto had also given striking results. Professor Swellengrebel had not been able to discover a single larva.

At Palermo, the Commission had visited a school in which the principles of practical hygiene were described to the teachers. This teaching had the greatest practical importance in that it enabled the minds of the new generation to be formed, for, hitherto, the lack of individual co-operation and of a spirit of responsibility had been one of the most important factors which had delayed the victory against malaria.

In the mining regions of the centre of the island the situation was complicated by the industrial conditions and the lack of comfort among the working population. The miners' syndicate had done very successful work, and at present it was no longer possible to meet with the deplorable type of *caruso* immortalised by Nino Martoglio. One no longer saw these poor workers issuing from the sulphur galleries bent under the weight of their burden and running with sweat. Human porterage had disappeared, ankylostomiasis and tuberculosis had decreased. The distribution of quinine and the minor "improvement measures" carried out in the lower galleries of the mines and in the neighbouring watercourses had achieved excellent results. There were now 23 permanent dispensaries and 22 distributing stations for quinine, with 22 practising doctors, 2 assistant doctors and 31 orderlies under the direction of Dr. di Giovanni, the untiring and enlightened pioneer in the struggle against malaria. The annual number of workers under medical attention was from 8,000 to 9,000.

In the province of Catania, the Commission had heard an impressive lecture by Professor di Mattei and had visited the Lentini marshes, the reclamation of which has nearly been completed. Owing to the new system of agriculture introduced into the region, malaria had decreased to a considerable extent. The Commission had visited in this region the Rockefeller Station, which was one among twenty-two which would soon be working throughout the country. In this connection, he would express the profound gratitude of his country for a work so highly enlightened and beneficent which was going forward under the control and the direction of the health administration of the country. In the destruction of larvæ this station had made encouraging experiments with Paris green, which was a compound of copper and arsenic acetate. Finally, near Syracuse, the Commission had visited the improvement works on the river Anapo, which affected 10,000 hectares. The filling-in of low ground and the cutting of more regular river-banks had been perfectly successful.

As a whole, the visit had been most instructive. Considerable progress had certainly been achieved in Sicily. Mortality from malaria had decreased by 81 per cent. In 1887, the death rate from malaria was 174 per 100,000 inhabitants. This figure had fallen to 19 in 1923.

Another favourable sign was the extreme vitality of the population. The birth rate was extremely high. The population, which had amounted to 1,000,000 a century ago and 2,000,000 at the date of the Union of Italy, now amounted to 4,200,000.

The period through which the country was at present passing was characterised by an impulsive energy which attacked the hardest problems, under the urgent direction of the Government. A very important law had been passed two years ago embodying a full programme of improvements, which included not only the hydraulic reclamation of the plains and valleys but a systematic organisation of the mountain basins and the application on a very large scale of minor "improvement measures" and land reclamation. Another law provided facilities for the construction of hygienic rural houses. Finally, a recent law had carried out a reform in decentralisation, giving to each region a supervisor of public works (*provveditore*). During the first year, one million lire had been devoted to minor "improvement measures" in Sicily out of thirty-five million lire to be spread over ten years.

Professor Nocht had made a tour in the Kingdom of the Serbs, Croats and Slovenes, in regard to which he would submit a memorandum.

The attention of the Commission had been drawn to the subject of malariological courses. He would remind the Committee that two types of courses had been planned, one for young doctors and the other which would enable malariologists to make practical studies. This year the first type of course had been tried. Forty-nine doctors, belonging to twenty different nationalities, had followed these courses in Paris, London and Hamburg. At the end of the course, the majority of them had passed some time in anti-malaria stations in Corsica, Italy, Spain and the Kingdom of the Serbs, Croats and Slovenes. The Commission for the moment confined itself to recommending that this practice be continued. A note by Professor Brumpt and Dr. Andrew Balfour emphasised the excellence of the results obtained. It was desirable that the hospital work should be developed and that the theoretical courses should always be followed by a prolonged practical study.

He next summarised the experiments made in Italy and Spain on the question of river deltas and briefly referred to other experiments on the relation between malaria and climatic and weather conditions. He added, in conclusion, that Professor Swellengrebel had submitted a short note on the position of the Dutch lowlands.

The studies of Professor Marchoux on the development of fever outside the districts in which malaria was endemic were being continued, as well as the experiments on the products to be used in addition to quinine. He had, during the previous session, given a brief account of the important experiments dealing with the secondary alkaloids which were being made in five different countries.

It was unnecessary to emphasise the exceptional gravity of malaria. Recent statistics compiled by Dr. Andrew Balfour gave the annual figure for the whole world of two million deaths, and the authority of Dr. Balfour was a guarantee that this figure was fairly correct. The death rate being from three to four deaths per thousand cases, it followed that there must be 650,000,000 people suffering from malaria, or a third of the human race. Though this figure might appear to be fantastic and paradoxical, it should be remembered in considering the overwhelming inadequacy of the present resources of quinine. Taking a yearly average of forty grammes of quinine per patient, 26,000 tons per annum would be necessary. It was urgent that an international conference should be called in order to examine methods of considerably intensifying the production. The State factory working in Italy produced 50 tons, which was sufficient for the country. The Government had further taken a lease for ninety-nine years in order to make plantations of cinchona-trees over an area of 1,720 hectares at Java. Important experiments had also been tried in Erythrea in the cultivation of cinchona.

At the previous session, the Malaria Commission had expressed a desire to study the derivatives of cuprein and hydroquinine. He would ask Dr. Mimbela to furnish some samples of *Remigia pedunculata*. It seemed that these two remedies had a much more pronounced efficacy against malaria than quinine, and that it might be possible to obtain the sterilisation of malaria patients through a complete disappearance of the gametes.

The Commission had done a great deal of work, and, if it had not achieved definite results, it had at least been able to prepare the ground. He would draw the attention of the Health Committee to Dr. Biraud and M. Mage, who had assisted the Commission during the tour. Their devotion and their conscientiousness and zeal had greatly facilitated the studies of the Commission, and he was happy to recommend them to the kind consideration of the Committee.

He submitted the following resolution :

"The Health Committee decides :

"1. To extend the study tours of the Malaria Commission to some extra-European countries where malaria prevails, notably the southern section of the United States of America.

"2. To continue the studies undertaken by the Commission and by certain of its members on :

"(*a*) The problem of deltas (already begun on the deltas of the Danube, the Ebro and the Pô) ;

"(*b*) The major sanitary measures, such as those carried out in Italy and Holland ;

"(*c*) Certain laboratory problems ;

"(*d*) The relation between certain meteorological conditions and the prevalence of malaria.

"3. To continue the study of the secondary alkaloids of cinchona, as well as of hydroquinine and cuprein derivatives, in order to collect material for an international conference on this subject during 1927.

"4. To repeat in 1927 the organisation of malaria courses, such as were held this year in the Institutes of Tropical Medicine at Hamburg, London and Paris, and to continue the practical stage in countries where malaria prevails."

The PRESIDENT thanked Dr. Lutrario and congratulated him, as well as the members of the Commission, on the important and considerable work which they had done in so short a time. On behalf of the Committee, he congratulated the Italian Health Administration, which had achieved rapid and surprising progress, particularly in Sicily. The thanks of the Committee were also due to the experts who had given their assistance, particularly Professor Marchoux, and the members of the Secretariat. The Health Committee particularly appreciated the cordial welcome of the Italian Government and the extensive facilities which it had accorded.

Professor NOCHT thought he was speaking on behalf of all the members of the Malaria Commission in expressing his profound gratitude to Dr. Lutrario, its Chairman, not only for the very precise report which he had submitted on the work done but also for the way in which he had directed and organised this work, particularly the last tour in Sicily. This tour had been extremely agreeable and interesting and had supplemented in a very timely manner the experiments and views of the members of the Commission. The kind welcome and generous hospitality of the Governmental and communal authorities, of the Italian doctors and the directors of industrial and agricultural establishments in Sicily were due not only to the well-known natural kindness and hospitable traditions of the Sicilians but especially and to a great extent to the preparatory work and the care of the Chairman, who, unhappily, had only been able to accompany the Commission during the first days of the tour.

Dr. LUTRARIO said he deeply regretted that he had been unable to participate in the tour up to its conclusion in consequence of a very painful bereavement. He cordially thanked the Commission for the sympathy which it had shown to him and for the way in which it had associated itself with his loss.

Dr. RAJCHMAN submitted some amendments of form to the draft resolution, *which was adopted in the following form :*

"The Health Committee decides :

"1. To extend the study tours of the Malaria Commission to some extra-European countries where malaria prevails, postponing to a future date the selection of those countries to be studied in 1927.

"2. To continue the studies undertaken by the Commission and by certain of its members on :

"(*a*) The problem of deltas (already begun on the deltas of the Danube, the Ebro and the Pô) ;

"(*b*) The effect of major sanitary measures, especially in Italy and Holland ;

"(*c*) The laboratory problems described in the resolutions adopted by the Committee during the October 1925 session ;

"(*d*) The relations between certain meteorological conditions and the prevalence of malaria.

"3. To continue the study of the secondary alkaloids of cinchona, as well as of hydroquinine and cuprein derivatives, in order to complete the preparatory measures for an international conference on this subject.

"4. To repeat in 1927 the malaria courses at the Institutes of Tropical Medicine at Hamburg, London and Paris, followed by the practical stage in countries where malaria prevails."

251. Work of the Smallpox and Vaccination Commission.

Professor JORGE (Chairman of the Commission) read a note (Annex 114) on the results of the enquiry which the Committee had decided to undertake in January 1926 on cases of encephalitis after vaccination.

A case observed in Germany had been brought to his attention. Encephalitis had appeared two days after inoculation. In these circumstances, it could not be attributed to the vaccination. This observation must also be applied to the statistics hitherto collected. Thus the English statistics gave two cases which had occurred two days after vaccination and two cases which had occurred four days after vaccination. Evidently cases of this kind must not be regarded as being on the same footing as those which had come to light twelve days after vaccination. There also existed cases where the disease had appeared later and in regard to which the same question arose. Dr. Raynaud had informed him that the Society of Medicine at Algiers had discussed the question of the virulence of the vaccine, and Professor Sergent had said that there had occurred to his knowledge a case followed by death. At the same meeting, a doctor had submitted a report on two cases of encephalitis following vaccination. Dr. Jitta had declared that the Dutch series was continuing and that he would show a diagram. This series went further back than the English series. The British Commission presided over by Sir F. Andrewes had obtained some interesting information, much of which had now found its way into medical journals. He referred to the publications of Mackintosh and others. He understood that the Vaccination Commission was entirely at liberty to quote from this report.

Researches had been carried out at The Hague in order to estimate the degree of activity of the lymph. A special effort was made to avoid using lymphs which were particularly potent and which might cause very violent local reactions and even gangrene. Four methods of valuation were used, the comparative reading of which was a fairly complicated matter.

Dr. JITTA said he did not claim to add anything to the statement of the Chairman of the Commission. As, however, his country had the melancholy privilege of furnishing a certain number of cases of encephalitis following vaccination, he would give some supplementary explanations. Dr. Bouwdyk Bastianse, Dr. Byl and Dr. Terburgh had described specially observed cases. Cases of encephalitis had been noted particularly in small communes, in some cases adjacent to one another, and several cases had even been noted in the same commune. The lymph used came from three different sources. Twelve calves had been used, and the original lymph was either of Dutch or foreign origin. The number of cases of encephalitis was not proportional to the number of vaccinations made. It had been possible to cause encephalitis by inoculating with lymph the brain of a rabbit. There had also been found in the brain of inoculated rabbits a virus which might be identified with the neuro-vaccine of Levaditi. It had not been possible to cause encephalitis in rabbits by inoculating with the neuro-vaccine the skin, the cornea or the testicles. On the contrary, no other virus had been found except that of the vaccine.

The series of cases of encephalitis had been particularly important in 1925, when thirty-nine cases had been noted, twenty-two of which had occurred in March. From July 1925 to January 1926, twenty-three cases had been noted. The experimenters attached a certain value to the coincidence between cases of encephalitis following vaccination and sleepy sickness, the culminating point of which was noted at the end of the winter and in March. Generally speaking, there was an impression that the epidemic was tending to decrease.

Dr. TSURUMI said that the Health Bureau of Japan had addressed an official letter to the health authorities of the prefectures and to medical practitioners, asking for information on this disease. He would communicate the results of this enquiry as soon as he had received them.

As to the study of the methods used by the official institutes and other establishments under State control for the preparation, examination, distribution and use of the lymph, he would like to know whether the Medical Director had already received a reply from the two Institutes of Japan. This reply had been sent some time ago.

Dr. RAJCHMAN said that the Section had received a reply from Poland. A commission had been appointed and was beginning its enquiry. The Section had also received a very detailed reply from Japan and also a reply from Dr. Gordon.

Dr. RAYNAUD said that, in Algiers, smallpox had lately decreased since the vigorous vaccination campaign introduced in 1907. Vaccination had been effected throughout the country. In 1922, 184 cases per six million inhabitants had been noted, and 98 cases in 1923. Suddenly, in 1924, the number of cases rose to 450, of which 359 occurred in the department of Constantine. One of the causes of the revival was due to the habit of the natives of vaccinating themselves from a sick person, as they continued to do in certain districts. In 1925, the number of cases rose to 1,660, and severe steps had been taken for a general vaccination of the inhabitants. At the moment of the first outbreak, many persons had been vaccinated and the vaccination had not taken. When the second outbreak occurred, these people were attacked by smallpox so seriously that they died. The mortality had been 30 per cent during the first outbreak and 50 per cent during the second. It was asked why vaccination had not resulted in immunity. It was already known that the period of immunity was not so long in hot countries, and that the vaccine lost its strength in course of transport. For the last year, the colonial doctors were unanimous in stating that they no longer obtained the same results as formerly. A meeting had been convened at Algiers, at which Dr. Lemaire had made a communication, which had been reproduced by the Paris Academy of Medicine,

regard to the period of immunity and the decrease in the effectiveness of the vaccine. In is connection, Dr. Sergent had declared that the vaccine had, on the contrary, a considerable tivity and that he knew of two cases of general vaccination followed by death. Another octor referred to two cases of death by encephalitis following vaccination. The question as now under examination. It was already agreed that it was important to provide Northern frica with a vaccine which was sufficiently active and of making the vaccinations frequently.

Professor NOCHT said he would like to know how the opponents of vaccination had made e of these facts. He was surprised that hitherto they had not been used in Germany.

Dr. CARRIÈRE said that the epidemic of alastrim smallpox was now at an end in Switzerland, cept in some sporadic cases. Vaccination was, up to a certain point, compulsory and had en rather intensively used. No cases had been noted of encephalitis following vaccination. As regarded the standardisation of the lymph, he had followed the work of Sobernheim Berne, and feared that the investigations proceeding at The Hague would not show very ear results. Each of the experimenters was practising his method and was expecting definite sults. Nevertheless, perhaps other interesting facts might emerge from this investigation.

Dr. JITTA said that, in the Netherlands he had noted effects of a remarkable intensity• ere was considerable inflammation of the arm and in certain cases gangrene. He had en obliged to vaccinate twelve officials, and he had noted that several of them fell sick. ere had been certain cases of very serious swellings, ulcers and gangrene. These accidents d disappeared at the end of eight days, but they were extremely painful and disquieting. believed that similar cases had been noted in other countries. Here there was a new velopment to be studied.

Professor PITTALUGA said that Dr. Gallardo, Head of the Vaccination Service of the Health stitute at Madrid, had studied the production and standardisation of lymph as well as the ssible connection between vaccination and the encephalitis epidemic. In Spain, it had been possible to establish by means of this examination any connection between the epidemic d vaccination.

Sir George BUCHANAN had little to add to the statement of Professor Jorge.

Since the report of Sir F. Andrewes' Committee had been communicated to the Hague nference, a special Committee had been instituted by the British Minister of Health for purpose of studying not only that report but also all the questions which came before Hague Conference. As he had mentioned at the last session, the Ministry and the official mmittee, of which Sir H. Rolleston was Chairman, had addressed a communication to the ncipal medical journals drawing attention to encephalitis following vaccination and inviting ctitioners immediately to communicate any cases which they might observe. Hitherto, y a single case had been noted and added to the 1924 series.

The enquiry instituted into the methods which should be followed in all institutes in which mph was prepared had made much progress, and it was important that the combined results uld be studied as soon as possible in order that certain principles might be authoritatively d down for the manufacture of lymph.

As regards the comparative enquiry into the various methods used in estimating the ency of vaccine lymph, the Commission had already recognised that, even if it were possible obtain a perfect standard, only a small part of the problem would be solved, since there uld arise immediately afterwards the question how uniformity in dosage could be ensured, this question raised the whole subject of the method of vaccination. The work on potency s none the less useful. The chief difficulty which still remained in adopting a standard of ency was that results obtained from experiments on animals and those performed on man e not always strictly comparable. On the whole subject, it was evident that international ordination of the efforts made by different national authorities was proving most profitable.

Dr. LUTRARIO observed that, when the first communication in regard to encephalitis owing vaccination had been made, he had declared that there had not, to his knowledge, urred a single case in Italy, and he had undertaken to make an enquiry. The replies received he Health Administration had been consistently in the negative. Further, certain indirect ors had shown that the greater number of cases of encephalitis did not coincide with the ods of vaccination. Out of 844 cases of encephalitis which had been studied, two cases y had occurred in the first year after birth, namely, at the period in which vaccination was mpulsory. In the army, all conscripts were compulsorily vaccinated. In 1923, two cases ncephalitis had been noted, two cases in 1924, and 11 cases in 1925, but it had been impos- e to establish any relation of cause and effect.

Dr. TSURUMI asked Professor Jorge if the Smallpox and Vaccination Commission could ude in its programme a study of the period of immunity and the effectiveness of the lymph, ch was a question of great importance.

The PRESIDENT noted that agreement in regard to the standardisation of the lymph uncertain. This did not mean that it would be impossible, in spite of the difficulty of enquiry, to arrive at a positive result. He would point out that, in spite of the marked rences between the methods used, it had been possible to obtain a single standard for anti-tetanus and the anti-dysenteric sera. The researches were being continued, and the mmittee could only urge the experts to persevere.

It would seem to be interesting and necessary to study the question of the revival of the nt action of the lymph, to which attention had been drawn almost everywhere.

Professor JORGE said he did not know what arguments were being used at that moment by the opponents of vaccination. He had, however, received a pamphlet in which it was especially urged that the time had come to ascertain what the vaccine was which had been used for a hundred years.

The reports on the standardisation of the lymph were disappointing at first sight, as might have been foreseen. In practice, however, the composition of the lymphs coming from one institute was always the same, and it now appeared, from the comparative study which had been undertaken, that the differences between the various methods were not very appreciable. During the study which was at present in progress, the best method would certainly become apparent.

The question of immunity, to which Dr. Tsurumi drew attention, was already on the programme.

Sir George BUCHANAN, reverting to Dr. Madsen's observations, said he understood that it might be possible to establish an arbitrary unit by different methods, but this would apparently involve the choice of some one institute from which the lymph should be taken for purposes of comparison, Such a choice would be difficult. He thought that the time had come for another meeting of the Commission with those experts who were dealing with lymph preparation and potency.

Professor OTTOLENGHI said that, at the previous session, he had drawn attention to the possibility that diseases of the animals from which the vaccine was taken — other than those with which the vaccine institutes had for a long time been familiar — might be transmitted to man, and he had asked what methods were used or contemplated in order to supervise more fully than before the health of the animals in question. This side of the enquiry was clearly of importance also in its relation to the principal problem studied by the Smallpox and Vaccination Commission.

Dr. RAJCHMAN reminded the Committee that a proposal had been made to him that Dr. Calmette's report should be published in the Annals of the Pasteur Institute. It had been observed, in reply to this suggestion, that such a publication would be premature, as the report contained a comparison of the various methods used, and it was not possible to arrive at a final opinion without having been able to examine all the lymphs submitted. Dr. Calmette had offered to devote a special number of the Annals of the Pasteur Institute to the publication of all the memoranda at a suitable moment.

As regards the next meeting of experts, a practical difficulty would arise in respect of credits. The most suitable date for this meeting would be one of the first weeks of 1927. It would then be possible to submit a report to the next session of the Health Committee.

Sir George BUCHANAN thought that the possibility of using the Annals of the Pasteur Institute was extremely interesting, but it was necessary to give the experts an opportunity of expressing their views on the method of publication.

As regards the next meeting, it was extremely difficult to draw the line between meetings of experts and meetings of the members of the Commission. The number of members of the Commission was small, and their inclusion in the expert conference involved at most the addition of four persons who were most closely interested in a problem the aspects of which were both administrative and technical.

Dr. RAJCHMAN said that, if the Commission considered it opportune, it might appoint representatives to sit with the experts. It was possible, however, that the experts would wish to have a preliminary exchange of views. Moreover, it was necessary to take into account the budgetary aspect.

Sir George BUCHANAN said that the experts with whom he had been able to confer in London had emphasised the desirability of the Commission preparing a satisfactory and practical programme of work for the next conference.

The PRESIDENT observed that it would be for Professor Jorge, whom he thanked for his work and for his report, to convene this meeting.

252. Revision of the International List of Causes of Death.

M. VELGHE submitted the following draft resolution :

"The Health Committee,

"Having considered the report of the Medical Director on the List of Causes of Death, the correspondence on this subject with the International Institute of Statistics and the observations made during the discussions in the Committee,

"Decides :

"(*a*) To entrust to a committee of experts the study of the documents transmitted to the Health Section by the Governments which comply with its request and of the preparatory work incident to the revision of the nomenclature now in use ;

"(*b*) To keep the International Institute of Statistics in touch with the work of the Committee of Experts and, when the moment appears opportune, to convoke a preparatory conference of the Committee of Experts and a delegation from the Institute in order to secure agreement on the questions which will be submitted to the future international conference."

M. Velghe, replying to Sir George Buchanan, said that this text covered not only the questions submitted by the Committee of Experts or the International Institute but also those which the Governments might intend to submit to the conference. The text might be made clear in regard to this point.

Sir George BUCHANAN observed that, in conformity with the spirit of the previous discussions, it was important that the experts should be chosen by the Governments to which application was made and should represent national committees wherever such committees had been established for the special study of the questions which would come before the next decennial conference.

The draft resolution was adopted.

253. Work of the Tuberculosis Commission.

Dr. TSURUMI (Chairman of the Commission) made the following statement :

"The present position of the work of the Tuberculosis Commission is the following :

"1. So far as the question of the standardisation of tuberculin is concerned, Professor Calmette submitted, at the last session of the Committee, an excellent report which has advanced the question both theoretically and practically. Professor Calmette, in this report, indicated that the best method of titration of tuberculin was effected by the subcutaneous injection of guinea-pigs. Nevertheless, it would at present doubtless be premature to propose the adoption of international rules in order to measure the activity of these products. It is important that their titration should still be the subject of experimental research.

"It might, however, be useful to recommend to the various laboratories in which tuberculin is being prepared for commercial use that it should be controlled, preferably by the method of subcutaneous injections by series, comparison being made with a standard tuberculin on an animal rendered sensitive to the injection.

"As the President of the Committee announced some days ago, the Permanent Standards Commission, as a result of his (Dr. Tsurumi's) communication in regard to the work of Professor Calmette, has decided to arrange for a comparison of the existing standards of tuberculin, both human and bovine.

"2. The question of a thorough enquiry into tuberculosis and its consequences from the social point of view makes it necessary to study certain special points, and among these points the examination of the causes of the decline of tuberculosis mortality is, in our opinion, one of the first importance. In this connection, I wish to point out that, at the fifth session of the Committee, steps were taken to institute such an enquiry in Denmark, Sweden and Norway, in conformity with a detailed programme adopted by the Committee. As this enquiry is not yet concluded, the Commission is not for the moment in a position to present the report in question. Nevertheless, the President of the Health Committee has assured us that this subject might usefully be examined during the next session.

"3. In regard to the request of the Government of the Union of South Africa addressed to the Health Committee, the Medical Director has communicated to the Committee a letter addressed to the South African Government and the reply of that Government.

"According to this reply, the South African Government intends itself to carry out some of the items on the programme suggested by the Committee during its fifth session. It has, nevertheless, expressed the desire that, in the event of any new factors coming to light, it might formulate a request to the Committee for further advice."

The PRESIDENT thanked Dr. Tsurumi on behalf of the Committee.

254. Health Conditions in Mandated Territories.

Professor OTTOLENGHI asked the President if it would be advisable to convene a meeting of the Commission on the health conditions in mandated territories, in view of the fact that the Health Committee would soon have finished its work, and again had not had an opportunity of dealing with this very interesting question.

Dr. RAJCHMAN said that the Health Section had been obliged to note that the observations which it had been able to collect from the reports on the mandated territories were too incomplete to be susceptible of appreciation as a whole.

Sir George BUCHANAN said that the question of the consideration to be given to the health reports from mandated territories might usefully be placed on the agenda of a later session.

SIXTH MEETING.

Held on Monday, October 18th, 1926, at 9.30 a.m.

Present : All the members of the Committee with the exception of Professor Léon Bernard, Professor Cantacuzène, Dr. Chagas, Surgeon-General Cumming, Dr. Granville and Miss Alice Hamilton.

255. Examination of the Report of the Medical Director on the Work accomplished since the Sixth Session of the Committee (*continuation*) : Interchange of Public Health Personnel.

A. *Interchanges since the Sixth Session of the Health Committee.*

The section of the report of the Medical Director on these interchanges was read (Annex 108, Appendix (*b*)).

1. *Interchange in Denmark.*

No observations.

2. *Interchange of Sanitary Engineers in Great Britain.*

Sir George BUCHANAN thought that the interchange of sanitary engineers had been a success. If the arrangements made had been satisfactory, this was due, in the first instance, to the unwearied efforts of Dr. H. T. Calvert, his colleague at the Ministry of Health, and he would like the name of Dr. Calvert to be mentioned in the report of the Medical Director. As the project of an interchange of sanitary engineers, beginning in England, had been specially pressed by Dr. Lutrario and M. Velghe, it would be useful for the Committee to hear their views on this interchange and any suggestions which might serve as a basis for improvement in future interchanges of this kind.

If the Committee thought it desirable to organise another interchange of sanitary engineers in Great Britain, it might be preferable to wait until 1928, as recently the interchanges in that country had succeeded one another rather rapidly.

M. VELGHE said he was glad that he had been associated with Dr. Lutrario in putting forward this idea. He had gathered from a conversation with the Belgian participant that the interchange had met with entire success. He approved the idea of organising a new interchange of the same type in 1928.

Dr. LUTRARIO said he was glad to note the success of the interchange at the moment when his country was undertaking, or was about to undertake, important sanitary works. He was particularly glad of the opportunity which had been offered to a sanitary engineer from his own country to realise what was being done elsewhere.

3. *Interchange of the Combined Type.*

Dr. JITTA said that the Dutch participants had come back delighted with their trip. The participants whom he had seen in Holland were not all, however, sufficiently qualified to appreciate the value of the interchange and to derive from it the educational advantages which it offered. It was indispensable that in future a more careful selection of candidates should be made.

M. VELGHE agreed, and said he wished to make an important criticism. Programmes drawn up by the administrations concerned were generally too full. The participants complained of being overworked. It was advisable to take this fact into account in future interchanges.

As regards the final conferences, he understood why it was desirable that they should be held at Geneva. When the participants arrived at Geneva, however, they were tired and usually had not had time to study the documents which had been distributed to them during the interchange. It was accordingly to be feared that, in spite of what was said in the report, the discussions at the final conferences were not very thorough. Perhaps it would be advisable to allow an interval to elapse before the final conferences took place.

Dr. RAJCHMAN replied to the observations of Dr. Jitta and M. Velghe.

It was very difficult, generally speaking, for the Health Section to make a choice among the candidates. The candidates were presented by the respective health administrations, and the Secretariat must rely on them. All possible precautions were taken in making the final selection. It was well, however, that M. Velghe and Dr. Jitta had raised the question, as their observations would be recorded in the Minutes and transmitted as usual to all health administrations.

Experience had shown the twofold value of the final conferences held at Geneva :

1. It was indispensable that the participants should become acquainted with the Health Organisation and with the working of the League itself, all the more so as, at that stage of the tours, there were frequently misunderstandings on their part which a visit to Geneva would remove.

2. It was necessary for the participants to exchange views before returning home. At the beginning of each interchange the Health Section drew the special attention of the participants to the fact that they must not regard themselves as members of a conference which had to take decisions. He realised that the participants could not have time to prepare a technical report for the final conference, and they were therefore advised merely to prepare surveys which would be a useful basis for future reports. The participants were also reminded that their reports prepared in final form on their return must be submitted to their respective health administrations.

If the participants in an interchange were obliged to come to Geneva for their final conference some time after the close of the interchange, they would imagine that it was their duty to present to the Secretariat a detailed report on what they had seen and observed, and

the Secretariat might find itself in a delicate situation. Any conference assembled under the auspices of the Health Organisation must have a practical object in view and result in conclusions. The participants in an interchange, however, were not assembled to make recommendations. If the final conference were postponed, it would perhaps be difficult for it to keep its proper character.

All things considered, it certainly seemed worth while to assemble the participants at Geneva immediately after the interchange. According to the general opinion of all the participants, the discussions which took place at Geneva and the exchange of views with their colleagues helped them to correct misunderstandings which might have arisen during the tour and eventually to prepare a more thorough report.

This question of possible misunderstandings was very important. Generally speaking, at the end of an interchange, the health administration of the country visited was asked to appoint a representative to attend the final conference. It was significant that, on almost every occasion, the representatives of the health administrations were asked elementary questions which one would have thought had been dealt with during the interchange. This showed that a discussion at a final conference on elementary questions was of the utmost advantage for the participants.

M. VELGHE thought that, if the participants, after a study tour, still felt it necessary to raise elementary questions, it would have been better to raise them during the tour. He was not competent to formulate any definite proposals, but he would ask the Medical Director to reflect on the ways in which the interchanges might be improved and to examine whether, in future, the final conferences might be presided over either by the Medical Director or by a member of the Committee.

As regarded missions, he would point out the disadvantages inherent in too-frequent individual missions for free organisations dependent on a health administration like his own. These organisations were directed gratuitously by doctors whose time was of value. It was necessary that such missions should be very carefully considered in advance. If some of them related to identical questions, they might be combined. A succession of several missions dealing with the same question sometimes resulted in frequent dislocations at short notice of the organisations to which he had referred. He did not wish this observation to be placed on the Minutes, but he would be grateful to the Medical Director to take it into account.

Dr. RAJCHMAN, on the contrary, preferred that the observations of M. Velghe should be included in the Minutes. He had for the last five years drawn the attention of the Committee to the disadvantages inherent in the individual missions referred to by M. Velghe.

Individual missions had, at the outset, seemed to certain members of the Committee more useful than collective interchanges, and it had even been proposed to reserve the available credits as far as possible for such missions. It was evident that it would be easier for a health administration to have thorough studies made for one year by a hundred doctors participating in an interchange divided up into several groups than by the same number of participants coming successively upon individual missions. For this reason, in his reports of the last two years, he had insisted that individual missions should be reserved for quite special cases. He had even laid down the two following principles :

1. The mission for which a health administration presented a candidate should relate to a subject which had a special importance for that administration.

2. The subject should, as far as possible, come within the general programme of the Health Organisation.

Clearly, this last condition was not in all cases possible, but it would be well if the observations of M. Velghe should result in limiting requests for individual missions.

The PRESIDENT supported the observations of the Medical Director on the advisability of holding final conferences at Geneva. It appeared from the experience acquired in Denmark with regard to the interchanges that these final conferences enabled incredible misunderstandings to be removed, misunderstandings which were not only deplorable for the participants themselves but also for the administration which had organised the interchange. Instead of allowing a long interval to elapse between the interchange and the final conferences, would it not be possible merely to allow participants, before the final conferences, one or two days' ... ?

Professor OTTOLENGHI said that, judging from his experience as a member of the Malaria Commission, which had made many study tours and had effected real "interchanges", it was very useful for all the participants to meet in a final conference. It would be preferable to hold conferences of this character in the country visited before leaving it, as the health administration of that country would be in a position to furnish all the necessary explanations. In any case, however, it was a good plan, as a general rule, to invite representatives of the health administrations to the final conference. He supported the proposal of M. Velghe to the effect that the conference should be presided over either by the Medical Director or by one of his qualified assistants, or by a member of the Health Committee. As the President suggested, it would be advisable to allow the participants a day of rest. Generally speaking, it was much better for such meetings to be held immediately after the tour, when the impressions were still fresh and when it was possible to profit by the presence of all the participants, and to have a detailed discussion, since this procedure had always proved to be highly beneficial.

His colleagues Dr. Jitta and M. Velghe had raised the question of the presentation of individual candidates. Perhaps the present conditions would be improved if each member of the

Committee could be supplied as early as possible with the programme and all other details and could thus in their respective countries agree in good time with his health administration as to the choice of candidates.

Sir George BUCHANAN said he thought that the final conference enabled the participants to refresh their memory on points which they might have forgotten or to discuss questions into which they desired to go more thoroughly.

It was difficult to ask participants, at the end of a tiring tour during which they had seen a great many things, to agree on some special point which they had not perhaps studied with particular care and in regard to which they were not sufficiently informed. It would no doubt be advisable to give them one or two days' rest ; but, after all, these conferences should not be used for the preparation of scientific summaries on the work of the health administrations visited. Their principal object was merely to help the participants, before separating, to go over their notes and to exchange views.

The recent interchange of port medical officers had shown the advantages of a member of the Health Committee participating in the interchange and presiding at the final discussions.

As regarded the choice of candidates, it was undoubtedly the fact that, in rare instances, the whole interchange had suffered because a particular candidate had been chosen who was ignorant of the language of the country visited or had a quite insufficient expert knowledge of the subjects which were dealt with during the interchange. This might be unavoidable, however much care was taken, but it should be recorded, as such observations were calculated to strengthen the authority of the Medical Director in the appointment of the participants. The various members of the Committee or the members of the Office international might perhaps assist in these appointments, more than was the case at present, by giving their personal suggestions.

As regarded individual missions, much depended on the subject treated. It was undesirable in most cases to give an individual a roving mission to study health questions in general. But individual missions might be extremely valuable when they dealt with special points — for example, in the sanitary administration of ports. They should not be condemned wholesale.

It would be difficult to postpone the final conferences and to bring back the participants to Geneva at a later stage. The participants often included officials who were extremely busy. Their work accumulated during their absence, and their chiefs would be unwilling to give them a new period of leave in order to come to Geneva.

Dr. RAJCHMAN said he would be happy if the members of the Health Committee would help the Secretariat in the selection of the participants for the interchanges. This was actually done, at present, so far as the majority of the countries were concerned. He explained under what conditions the health administrations of many countries appointed their candidates in collaboration with the members of the Health Committee.

There was every reason to improve the final conferences, just as an endeavour was made to improve the system of interchanges. Three principal points appeared to emerge from the present discussion, and these points would be taken into account in the future :

1. The health administrations concerned should always be represented, if possible, at the final conference. This was the practice which had hitherto generally been followed.

2. There was every advantage in the final conference being directed by a member of the Committee, as had already been done by Dr. Jitta and Dr. Raynaud. In the absence of a member of the Committee, the Medical Director would preside over these conferences, or in the event of his absence from Geneva, he would delegate this duty to his colleague who was acting as Director of the Health Section.

3. It would be useful for the final conference to be preceded by an exchange of views in the country where the interchange had taken place. The programme of the interchange might be lightened by one day which would be devoted to this exchange of views. Such a meeting would certainly be possible during the progress of the interchange which would take place in Great Britain in 1927. This interchange would consist of groups of only two or three persons, who would have full leisure to discuss all questions among themselves and with a representative of the British Public Health Services.

In regard to individual missions, he agreed with Sir George Buchanan and M. Velghe that it was desirable to devote them to very important subjects and to reserve them for officials who came from distant countries.

Sir George BUCHANAN agreed, but considered that public health officers, even of neighbouring countries, might sometimes benefit by individual missions on specialised subjects.

Dr. JITTA said that, during the interchange which had taken place in the Netherlands there had been a final conference of the participants in the country itself, under his chairmanship. He had been favourably impressed by this conference. The utility of the final conferences at Geneva became apparent in cases where it had been possible to prepare for them by small conferences held during the tour and at which the work was divided among the participants who knew in advance the subjects with which they would be expected to deal at the final conference.

Dr. RAJCHMAN explained that this previous division of work had been the usual practice for three or four years. At the first meeting, each participant had been asked to choose a subject and to prepare notes on the question with which he elected to deal.

Dr. RAYNAUD thought, with Sir George Buchanan, that the health administrations would find it difficult to grant their members who had participated in an interchange further

leave in order to come a second time to Geneva. He would insist, in passing, on the desirability of the participants being able, if they wished, to take recreation during the tour by visiting the artistic treasures of the country in which they happened to be.

Dr. LUTRARIO drew attention to the question of language. It was very easy to find candidates for a study tour in a French-speaking country, but it was very much less easy to find candidates for a tour in an English-speaking country. A large number of highly qualified candidates were unacquainted with English, and experience showed the disadvantages of such a state of affairs. The Medical Director might perhaps examine the possibility of attaching an interpreter to the interchange, as had been done at the beginning.

4. *Interchange in the Basins of the Baltic and the North Sea.*

The paragraph in the report of the Medical Director on this subject was read.

Dr. JITTA summarised his provisional report on this interchange (C.H. 521), as follows :

"The party was composed of fifteen members, including medical officers from the ports of Antwerp, Havre, Hamburg, Bremen, Liverpool, Memel and Rotterdam, the Chief Medical Officers of Health of Copenhagen, Nantes, Helsingfors, Riga and Bergen, a representative of the British Ministry of Health, a representative of the Department of Commerce and Transport of the Soviet Republic, the bacteriologist of the port of Göteborg and two representatives of the Health Committee of the League of Nations.

"The tour began at Riga and Libau and continued through Danzig, Stettin, Copenhagen, Hamburg, Bremen, Rotterdam, Amsterdam, Antwerp, Havre, Southampton, Liverpool and London, finally ending at Geneva.

"The successful carrying-out of the programme was due in no small degree to Dr. Stade, of Danzig, who not only arranged the journey but assured its smooth running.

"Everywhere great importance was attached to the relations established not only between the members of the party but also with the authorities of the ports visited. These relations are already sufficiently close to facilitate exchanges of ideas in the future and perhaps the adoption of measures for the various ports by means of a new international health convention.

"Everywhere attention was drawn to the organisation and geographical position of the ports and especially to the measures taken to prevent the spread of infectious diseases from overseas.

"Supervision consists primarily in the inspection of ships on their entry into port in a place as far distant from it as possible.

"At most of the ports there are isolation stations, but the utility of these stations is being increasingly questioned, except in cases where it is not possible to send the patients to hospital. The drawback to these stations is that they are hardly ever in use and are consequently ill equipped and deficient in staff.

"The attention of the members was especially drawn to the measures taken for preventing human or rat plague.

"At Hamburg, Amsterdam and Liverpool, drastic measures are taken to destroy rodents and prevent them passing from one ship to another or to the shore. The destruction of the rodents is everywhere effected by means of asphyxiating gases, either sulphuric acid or carbon monoxide or cyanogen gas. The chief difficulty is to find the best system of disinfecting ships carrying cargo. Another important problem is the devising of adequate precautions in the use of cyanogen gas.

"Particular attention was devoted to the drinking-water supply and the methods of removing refuse. Generally speaking, conditions were found to be satisfactory in most of the ports.

"Attention was also given to measures for the prevention of venereal diseases amongst seamen, for the housing and feeding of seamen at the ports, and for providing them with first-aid and ambulances. A good deal of attention was also given to the measures taken to safeguard the health of emigrants and immigrants, both in the ports and on board, especially during the voyage.

"To sum up, the tour of the Baltic and North Sea ports was extremely valuable for the members of the mission. They had an opportunity of seeing how a port ought to be equipped and were able to take stock of the improvements which might be introduced in their own or other countries.

"The ties formed will be profitable both to the participants and to those who were responsible for their guidance. The exchange of ideas and impressions cannot but be useful, and personal acquaintance with the authorities in the different ports may lead to fruitful collaboration in the general interest."

The PRESIDENT thanked Dr. Jitta for his report and for the way in which he had directed the interchange. He also thanked Dr. Stade.

Sir George BUCHANAN associated himself with the President's observations.
He would venture to make two remarks concerning the provisional report of Dr. Jitta :

1. In regard to the campaign against rats, the report contained the following phrase page 5 : "The members of the Committee did not believe in the effectiveness of measures destruction on the vessels — at least, so far as they had seen them applied". He did not

question that this was the opinion of the members of the Committee, but it was not to be forgotten that there were various methods of protection against rats. The question had been extensively studied, particularly in the United States. The method which consisted in blocking any passage enabling the rats to go from one place to another gave very satisfactory results and might represent a very substantial economy by comparison with periodic deratisation. The sentence to which he had referred might give rise to mistaken interpretations.

2. In regard to the questionnaire sent to the port authorities, the report, on page 3, regretted the delay in the receipt of certain replies. Great Britain was among the countries to which this applied. In point of fact, the British administration had been somewhat alarmed at the number and comprehensive character of the questions put, and it preferred itself to prepare its own programme without having to furnish in advance such a considerable quantity of information.

In view of the very great value of the interchanges from the point of view of the organisations represented in the Office international d'hygiène publique, he would express the hope that Dr. Jitta's report would be communicated to the Committee of the Office international. This report would be of use in view of the special concern of that Office with quarantine questions.

M. VELGHE associated himself with the thanks addressed to Dr. Jitta and to Dr. Stade. He had been able himself to realise to what extent this study tour had been interesting and effective.

He would venture to draw the attention of his colleague to the paragraph on page 4 of his report in which reference was made to a hospital for infectious diseases where the experiment was tried of dealing in the same ward with sick persons suffering from various diseases or more than one disease. He feared that the inclusion of this sentence seemed to constitute an unreserved approval of this practice. Supplementary explanations were essential. In his view, it was necessary to discuss the question thoroughly, but such a sentence as that to which he had referred might lead to dangerous consequences.

Dr. JITTA thanked his colleagues on behalf of Dr. Stade and on his own behalf. His report was provisional, and he had no objection to suppressing the sentence to which Sir George Buchanan had drawn attention. He had inserted it in his report because the arrangements seen by the members of the interchange appeared to them to be complicated and costly. He was not unaware that, in the United States, opinions were favourable to this system and that the ships which were rendered inaccessible to rats were more easily allowed in the ports than other ships.

If the Health Committee agreed, he was prepared to give an account of the interchange to the Office international d'hygiène publique.

He would observe, in reference to the observation of M. Velghe, that this passage in his report was only a statement of fact and not the expression of an opinion. He was ready to modify it so that there should not be any misunderstanding.

The PRESIDENT, referring to the suggestion of Sir George Buchanan that a statement should be made to the Office international, thought it would be better to await the final report.

Senator POTTEVIN supported the suggestion of Sir George Buchanan.

Sir George BUCHANAN thought that a statement of this kind would be very useful for such of the members of the Committee of the Office international who did not form part of the Health Committee. He was merely proposing that a short summary of the facts should be made, which might be preserved in the records of the Office international as an indication of the work recently done by the Committee in a particularly interesting field.

The PRESIDENT said that, in these circumstances, the suggestion of Sir George Buchanan would be followed up.

B. *Programme of Interchanges for* 1927.

This chapter of the report of the Medical Director was read.

1. *Interchange in Great Britain.*

Sir George BUCHANAN said that the British administrations, acting, as before, with the invaluable aid of the Society of Medical Officers of Health, would do their best to assist the interchange outlined in the Medical Director's report and would welcome suggestions in regard to details.

2. *International Continuation Course in Public Health.*

Dr. RAJCHMAN explained that the idea of this new type of interchange had been suggested by the Directors of the public health services of several Balkan countries. These countries proposed to set up continuation schools of health, but, pending the carrying-out of this plan, it seemed useful for them to improve their official medical staff and to acquaint that staff with the present position, in theory and practice, of public health administration. The system of interchanges which had so far taken place only gave them partial satisfaction, as these interchanges, in which a limited course was given dealing with the health situation of a particular country, did not include the study of principles. For the same reasons referred to a moment ago by Dr. Lutrario, it was preferable that this course should be given in French and in a French-speaking country, the French language being, with the German language, the most widespread among health experts. Professor Léon Bernard had approved this idea. The participants

would be chosen by the health administrations with a view to studying special problems. He would remind the members of the Committee that he had distributed to them a letter from Dr. Scholtz, Secretary of State for Hungary, Director of the Health Department of the Hungarian Ministry for Social Affairs, in which Dr. Scholtz explained, in particular, the problems of interest to his administration. Similar suggestions might be formulated by other countries. The participants in the interchange would be divided into five or six groups, placed under the direction of lecturers. The interchange would include a six-weeks stay in Paris and a six-weeks tour, and it would comprise public health officials.

Dr. RAYNAUD cordially supported the proposals of the Medical Director.

Professor OTTOLENGHI was glad to have the explanations of the Medical Director, which had removed certain misgivings to which the reading of this passage of the report might give rise. The report might leave the impression that the new system would result in the creation of a kind of super-school of health, and this was a conception which everyone desired to eliminate. Perhaps the report might be made clearer on this subject. Either in the report or in the Minutes, emphasis might be laid on the fact that it was not in reality proposed to institute a new type of interchange but to extend that branch of the interchanges devoted to general courses.

It would also be advisable to make it clear that Paris was chosen only as a beginning, but that subsequently courses might be given in other countries whose language was extensively used or which were of special interest owing to their health conditions or in view of the efforts they had made and the results obtained in questions of public health.

Professor PITTALUGA said he appreciated the full importance of the suggestions of the Medical Director. He would like, however, to have some explanations. Was it proposed to co-ordinate university instruction in public health and the practical application of the rules of health by the health administrations ? If this were not the case, it would nevertheless seem that this idea was worthy of attention.

This passage of the report by the Medical Director, instead of defining the subjects contemplated for the first course, indicated the nationality of the professors whom it was proposed to convene. This choice was doubtless founded on the fact that the professors suggested were experts in the study of certain questions.

Dr. RAJCHMAN thanked Professor Ottolenghi for having drawn attention to various passages in his report which it would be advisable to develop.

In reply to the first observation of Professor Pittaluga and in order to remove any misunderstanding, he proposed to replace in the second paragraph the reference to professors by a reference to lecturers. As Professor Pittaluga presumed, the indications concerning the nationality of the lecturers to be chosen corresponded with a definite programme. The report did not contain any clearer indications on this subject because it was necessary first of all to secure the approval of the Health Committee.

Sir George BUCHANAN said that, unlike Professor Ottolenghi, he considered that the new interchange differed completely from the previous interchanges. There seemed to be no reciprocity about it. It was to be, in effect, a course of instruction in hygiene for the public health officials of certain countries. If the Committee were to be enabled to agree to this innovation, it would be necessary for it to be convinced, in the first place, that this system was in urgent demand by the countries concerned, and, in the second place, that the instruction desired could not be obtained already without the aid of "interchanges". Were there not already institutes which could give these courses ? In any case, if the idea were carried out, the Committee should provide adequate remuneration for all the lecturers. That part of the proposal which required lecturers from his country to come to Paris presented considerable practical difficulty. If it applied to British officials, it seemed doubtful that their authorities would grant them the necessary leave for a purpose of this kind. If it were proposed that a special study should be made in England by students who could only receive instruction in French, something might be done to find a suitable lecturer.

Professor NOCHT also feared that the question of language would give rise to difficulties. Moreover, if the courses were arranged, as proposed, for the middle of January, it would perhaps be impossible for German lecturers who were university professors to go to Paris at that date, even for a week.

The PRESIDENT had the impression that his colleagues were in favour, in principle, of the proposals of the Medical Director and that they were mainly thinking of the practical aspect of the problem. The Medical Director might be left to examine methods of overcoming the difficulties to which reference had been made.

Sir George BUCHANAN hesitated to give his approval in principle until an answer had been given to the two following questions :

1. Was this new type of interchange requested urgently by several administrations ?
2. Was there not some other method of obtaining the desired result, and was the Health Committee qualified to undertake this new task ?

Dr. RAJCHMAN said that the idea of these interchanges had been supported by the Director of Public Health of Bulgaria, by Dr. Stampar and by others. These interventions had seemed to give sufficient ground for a preliminary examination of the question by the Health Committee.

It was difficult at the moment to reply definitely to the second question of Sir George Buchanan. He did not think that there existed any continuation courses in public health in any of the principal centres in French-speaking countries.

He did not think it could be maintained that the new course was not an interchange in the proper sense of the word. Hitherto, the participants had, as a rule, devoted the first week of their tour to a general conference and had afterwards made a study tour of four weeks. It was now proposed that the preliminary conferences should last for six weeks and that, instead of dealing with the experience of a single country, they should deal with the experience of various countries. This interchange might be compared with the special interchanges on school hygiene and on tuberculosis.

He would say, in reply to Professor Ottolenghi, that it was well understood that the courses might be organised in other languages, if the necessity arose. In certain parts of Europe, another language than French would perhaps have to be chosen. The question should be examined very seriously.

Dr. RAYNAUD explained that, in his case, it was not during his training at the school of medicine that he had learnt health administration but during the whole of his experience. The idea of a course which would enable the participants in these interchanges to learn in six weeks' theoretical work and six weeks' practical work what their elders had taken so long to achieve must in principle be approved. As the Medical Director had said, after having begun the course in Paris, the method might be extended to other centres in accordance with the experience acquired.

Professor OTTOLENGHI wished to remind the Committee and to emphasise that he had no intention of making this question of language a question of nationality. It was quite natural that, since the first course would be conducted in French, it should take place in France. Another year, the course might be given in a country in which another language was spoken which might not even be very widespread. It would be sufficient for the courses to be conducted in a language that was chosen as being sufficiently widespread. No difficulty would be experienced ; there was none this year, even though the lecturers were not all French. The principal point was that the courses should take place in different countries, account also being taken of the contributions made by those countries to the development of public health.

Professor PITTALUGA thanked the Medical Director for his explanations. Even if the object of these courses was not essentially to associate educational teaching with the administration of public health, the proposal would still be interesting.

For the practical carrying-out of the programme it would be necessary to rely on the Health Section. The Health Committee should only have to discuss its general lines.

Dr. RAJCHMAN explained that, in presenting a new proposal, he had felt it his duty not to confine himself to setting forth general principles but to show also the way in which they would be applied. He was prepared to modify the text of his report in order to satisfy Professor Pittaluga.

Professor PITTALUGA said that his intention in presenting this observation was to reserve a certain liberty for the Health Section, particularly in the choice of persons.

The PRESIDENT asked his colleagues whether they agreed on the principle of the contemplated interchange.

Sir George BUCHANAN said he was ready to accept the principle provided he knew what this acceptance implied. The Medical Director and Dr. Raynaud had given a satisfactory reply to his first question. It appeared that the institution of a course in France corresponded with a substantial demand which the Committee might reasonably endeavour to meet.

According to the actual proposal, the course would begin on January 17th at the Institute of Health of the School of Medicine in Paris. Professor Léon Bernard had been invited to direct the course, in which foreign lecturers would participate and for which they would presumably be paid.

But another part of the programme was that the foreign lecturer should afterwards take some of the students for demonstrations in his own country. Were the two essential to each other ? Must it be a condition that the instructor who demonstrated in his own country must first have come to Paris to lecture in French at the Institute ?

Dr. RAJCHMAN said he wished to avoid any misunderstanding. He understood that Sir George Buchanan associated himself in principle with the contemplated course, making a reservation in regard to the participation of lecturers from his own country. He wished to know how he was to apply the resolution of the Committee. It appeared to him to result from the discussion which had taken place that the Committee would authorise the Section to adopt the new plan if the following points were borne in mind :

1. It would be possible to organise a course in a country whose lecturers would not be able to come to Paris ;

2. The possibility would be studied as soon as possible of organising a similar course in a different language in another country, if the first interchange should have satisfactory results.

The PRESIDENT said that the interpretation given by the Medical Director was correct.

Interchange in Germany.

Dr. RAJCHMAN read the following resolution, which had been adopted on October 12th by the meeting of German experts collaborating with the Health Organisation :

"1. The conference warmly welcomes the convocation of the group of German medical officers who collaborate with the Health Organisation, and considers that this meeting will serve to strengthen the liaison between the Health Organisation and this group.

"2. Recognising the great value of the arrangements initiated by the Health Organisation of the League of Nations for the interchange of medical officers, the conference warmly welcomes the intention expressed by the Health Organisation to make arrangements for an interchange of this kind in Germany during the course of 1927. The conference notes with particular satisfaction the declaration of Dr. Hamel that the German Government will do all in its power to ensure the success of this plan."

The Medical Director believed that the best time for this course would be the autumn of 1927.

The suggestion was approved.

Individual Scholarships for Far Eastern Countries.

Dr. TSURUMI said he was glad to announce that the collaboration between the Health Organisation and the Health Administration of Japan, for which the Medical Director had been good enough to take all the necessary steps, was now effectively established.

As regarded the interchange of experts between various countries and Japan, Professor Grey, of England, Dr. Fonseca, of Brazil, and Dr. Saulic, of the Kingdom of the Serbs, Croats and Slovenes, had already left for Japan to study the problems in which they were interested. He could assure the Committee that the Japanese health authorities and the institutes chosen for these doctors would very willingly give them all possible facilities. He hoped that these doctors would derive every benefit from the work which they would do in Japan and that, when their mission was completed, they would return satisfied with their course of study in that country.

Moreover, four Japanese experts had arrived at Geneva some days ago in order to study certain special problems in various European institutes. He would appeal to the good offices of his colleagues and ask them to allow his countrymen every facility.

Finally, Professor Saiki, Director of the Imperial Institute for Food Supplies at Tokio, was coming to Europe in the middle of January next in order to give lectures on nutrition in various places.

The PRESIDENT thanked Dr. Tsurumi for his statement.

Countries of Latin America.

No observations.

Various Interchanges (Physical Education, Health Insurance, Professors of Hygiene).

Professor OTTOLENGHI thought that it would be well, for the invitation to professors of hygiene, to adopt a different procedure from that in force in dealing with the health administrations.

Dr. RAJCHMAN said the question was somewhat delicate and would at a later stage be the subject of more definite proposals.

Professor OTTOLENGHI, referring to the collective interchanges mentioned in the last sentence of paragraph 6, thought that it would be interesting to inform the various Ministries of Public Health of the subject of the interchanges. The Ministries would then notify the professors so that the latter might judge whether the question interested them. He noted that the Committee would have an opportunity of discussing the question more fully.

Infant Welfare : Report of the Conference of Health Experts.

The PRESIDENT invited the Committee to examine the report of the Conference of Health Experts held at Geneva from September 27th to 29th, 1926 (Annex 115).

Resolution I. Immunisation against Diphtheria.

Professor OTTOLENGHI drew attention, for the information of the Health Section, to the interesting experiments made at the Children's Hospital at Bologna.

Sir George BUCHANAN asked what was implied by the approval of this resolution.

Dr. RAJCHMAN said that the Secretariat would get into touch with the countries in which immunisation against diphtheria had been practised on a large scale during the last two or three years and would ask them for reports on their experience. All the replies would be collected in a monograph and published as a sequel to the first communication relating to immunisation in the United States.

Sir George BUCHANAN thought that much of this work had already been done. In many countries, even in those in which the practice of immunisation was not very widespread the question had been made the subject of a fairly thorough investigation and documentation. If the Committee adopted the proposals submitted to it, would the data be published with critical commentaries or only represent a collection of information ?

The PRESIDENT thought it would be very useful to have such a collection of data, as it was only now that account was beginning to be taken of the results obtained. At the time when the report on the United States had been drawn up, the experiments had not been going on for a sufficiently long period to allow final conclusions to be drawn. The contemplated collection would be valuable for small countries which had not at their disposal information as complete as that of certain other countries.

A beginning must be made by collecting figures on this basis and, later on, a criticism of the results as a whole might be forthcoming. It would be difficult to entrust the staff of the Health Section itself with the critical part of the work.

Sir George BUCHANAN, while asking whether the time had yet come to make a critical study in the case of scarlet fever and measles, said he nevertheless believed that such a study if made by a specially qualified person, might be very valuable. If it were merely proposed to collect information, the Health Section, before undertaking any work, might usefully begin by ascertaining from certain public health administrations whether they had not already collected the necessary data from other countries.

Dr. CHODZKO also thought that it was too soon to discuss the results obtained. He would like, moreover, to raise a point of order. Was the Health Committee bound to accept the report of the experts, together with their resolutions ? This report contained certain passages to which he could not subscribe. Thus, reference was made to anæmia as though anæmia were a specific disease. Reference was made to rickets as though it were a disease arising from malnutrition, and this was not a proved fact. This report should not engage the responsibilities of the Health Committee.

Dr. RAJCHMAN reminded the Committee of the history of the report :

1. The Health Committee had decided to resort to the assistance of experts in dealing with the resolution of the sixth ordinary session of the Assembly.

2. The experts invited to define the questions to be studied had done so. Their views had not committed anybody but themselves, and neither the Committee nor the Health Section was responsible for them. Experts had discussed among themselves questions of principle, and their resolutions embodied the general views of the Conference as a whole.

The view that the time had not come to assess the results of vaccination had been supported by Professor Pirquet. The other members of the Conference, particularly the French member, had laid special emphasis on the efficacy of vaccination, which, according to them was now beyond all doubt. Finally, the whole Conference had agreed that a single document embodying the results obtained in the various countries should be prepared.

He would say, in reply to Sir George Buchanan, that if detailed monographs dealing with a single country existed, there would, of course, be no need for this work to be done over again. It would, however, be very useful to collect all the facts in a single volume. The conclusions to be drawn from these data would have to be examined later.

Professor OTTOLENGHI emphasised the importance for a health administration of having at its disposal complete information in the event of an epidemic. The critical study of the results obtained would be the task of the Health Committee when it had received all the information and a general report.

Dr. CARRIÈRE suggested that, if it were proposed to make as general an enquiry as possible into the question covered by the first three resolutions, this enquiry should be entrusted to the Office international. That Office would subsequently forward the results of its enquiry to the Health Committee, which would examine them.

Sir George BUCHANAN thought that the compilation of the results obtained would only be of use if accompanied by commentaries prepared by a highly qualified person. These commentaries would be presented in a way that would clearly indicate that they embodied the personal opinion of the expert.

As Dr. Carrière had suggested, it would be very useful to invite the delegates of the Office international to collect the necessary data. This would enable the Committee, at a later session, to enter upon a discussion which would be of great use to the person who would be entrusted with the work as a whole. The enquiry by the Office international would cover the first three resolutions.

Dr. RAJCHMAN did not think there was any need to refer these three questions to the Office international. The intention of the members of the Conference of Experts was not to obtain information from all the health administrations of the world but to select the few countries which had made experiments on a large scale in vaccination, and the enquiry would be addressed in each of these countries to the institute which had been in charge of this special work. As regarded scarlatina, for example, application would be made to the two State institutions which had carried out the experiments in Poland and in Hungary. If the application were addressed to the health administrations, the results would not be comparable and it would be very difficult to draw any conclusions from them. The enquiry proposed was not a statistical or epidemiological enquiry but a very complicated one involving various factors: statistical, epidemiological and laboratory work, etc.

He would ask the Committee to rely on the Health Section, which would choose the countries having a wide experience in vaccination, and which would present a report. The question of referring the matter to the Committee of the Office international would only arise when the Health Committee was in a position to formulate indications of an administrative character. If it were desired to avoid continuous overlapping, it was essential that the two bodies should not be entrusted with the same technical work. Both of them were very desirous of entering upon serious technical studies, but it was necessary to define their respective competence.

Senator POTTEVIN thought that, if it were proposed to enquire of a certain number of selected institutes as to their own experiments, the task would certainly come within the competence of the Geneva Organisation. If, however, the object was to obtain information in order to ascertain where it would be possible to find the necessary data, and if it accordingly became necessary to contemplate an enquiry extending to all countries in which experiments might have been made, resort should be had to the Office international, whose members were qualified, each for his own country, to furnish such information. It should be added that it was of great importance that the results obtained should be collected, to a certain extent, under the auspices of the health administrations, which would give guarantees that the information was objective.

The continuation of the discussion was adjourned until the next meeting.

SEVENTH MEETING.

Held on Monday, October 18th, 1926, at 5 p.m.

Present : All the members of the Committee with the exception of Professor Léon Bernard, Professor Cantacuzène, Dr. Chagas, Surgeon-General Cumming, Dr. Granville and Dr. Alice Hamilton.

57. Infant Welfare : Report of the Conference of Health Experts (*continuation*) (Annex 115).

Resolutions I, II *and* III. *Immunisation against Diphtheria, Measles and Scarlet Fever.*

Sir George BUCHANAN said that, without wishing to open a discussion at the moment, he would like to revert to the observations made at the close of the last meeting regarding references by the Health Committee to the Office international d'hygiène publique. Resolutions I, II and III contemplated an enquiry into the use of certain vaccines. The view had been expressed that the Office international could only render assistance when it was proposed to consider the steps which the Governments should take. He would, however, point out that the Office might give valuable assistance by a preliminary discussion which would give information on the position in the various countries. Such preliminary work had already been of great assistance to the Committee on two or three occasions.

Dr. RAJCHMAN said that the adoption of these three resolutions would, in his opinion, result in the preparation by the Secretariat of a preliminary technical report based on the information collected in certain countries during the last three years. When this report had been completed, the enquiry might be extended according as the Health Committee would decide.

Sir George BUCHANAN considered it probable that the various questions relating to infant welfare would remain on the programme of the Committee for a long time to come. When the Committee had been reconstituted and had to decide as to the suppression of certain of its Commissions or the appointment of new Commissions, it might be useful to consider the appointment of one on which members of the Health Committee could sit, together with the experts who had rendered such valuable services at the last Conference. He distinguished between a conference of experts which did its work and reported and a permanent body of experts meeting from year to year. In the latter case, a Commission including members of the Health Committee ought to be formed.

Finally, the investigations on immunisation had two aspects :

1. Was it desirable to establish a system of immunisation applicable to all children under twelve months ?

2. What was the value of the immunisation applied to children or persons of all ages ?

Did the enquiry referred to in Resolutions I, II and III cover these two aspects of the problem ?

Dr. RAJCHMAN replied that the enquiry covered only the second aspect. The sole problem for the moment was to collect information.

Resolutions I, II *and* III *were adopted.*

Resolution IV : *Budgetary Arrangements for the Execution of Resolutions* I, II *and* III.

Dr. RAJCHMAN said he thought that it would be for the Budget Commission of the Health Committee to consider this resolution.

Resolution IV *was adopted.*

Resolution V : *Instruction in Child Hygiene given to Medical Students, Nurses, etc.*

Resolution V *was adopted.*

Resolution VI : *Infant Mortality.*

Dr. RAJCHMAN said that this question of the mortality rates had been examined with particular care. The necessity for a preliminary enquiry had become obvious, but it was hoped that a definite scheme might be established in January 1927. The proposed enquiry should begin in the first months of 1927 and cover a period of twelve months. The Italian member had observed that, in certain countries, particularly in Italy, it would be useful to make a preliminary study of the statistics relating to the country as a whole, and the last paragraph of the resolution had been introduced in order to meet this suggestion.

The countries of Latin America had made two appointments. Argentine had proposed Professor Alfaro, and Brazil had proposed Professor Figueira as corresponding members. He hoped that these proposals would be adopted. In view of the special importance of this question for the countries of Latin America, it might be useful to invite the medical authorities of these countries to make a preliminary trial in order to ascertain under what conditions the proposed study might be undertaken in their own countries. The new conference which would assemble within three months could communicate to them the results of the European enquiry, and a very effective collaboration might be organised. Moreover, the Government of Uruguay would be very glad if a future meeting might be held at Montevideo.

In this connection, he would remind the Committee that the question of technical liaison with Latin America had been much discussed at the last session of the Assembly. Two schemes were presented, of which one was of particular interest to the Health Section. After a long discussion, the delegates of the Latin American countries obtained the adoption of the proposal to insert a general credit of 30,000 francs in the budget to ensure this technical liaison. It accordingly seemed possible to reckon upon limited but adequate financial resources.

The PRESIDENT was sure that the Committee was in agreement as to the appointment of the two corresponding members from Latin America.

Professor PITTALUGA said he would be lacking in his duty if he did not voice the opinions of the three countries of Latin America which he had visited. He had met everywhere with a very cordial desire to see the establishment of intellectual and scientific relations with the technical bodies of the League of Nations, and particularly with the Health Committee. The Committee would never have a more useful occasion than the present one for establishing fruitful relations with all the States of Latin America which were so brilliantly represented on the Committee by Dr. Chagas and Dr. Mimbela.

Dr. MIMBELA said he would not fail to forward any communications which might interest public opinion in his country, in which there were certain experts who would be able to co-operate very effectively with the Health Committee. He hoped that Professor Pittaluga would be able to continue in Peru, as well as in the other States of Latin America, the remarkable propaganda which he had already undertaken with authority and success.

Sir George BUCHANAN observed that it was impossible to object to the extension of the enquiry to Latin America. The same question, however, immediately arose in regard to Australia and New Zealand, where the infant mortality rates were among the lowest in the world. By the same reasoning, it was possible to anticipate an extension of the enquiry to Asia and Africa.

In regard to the following passage in the resolution : "the study should be made from the medical and public health rather than from the statistical point of view", he had always opposed the general tendency to regard medical statistics as a separate and impenetrable mystery. The following text might be preferable :

> "It is understood that the enquiry will not relate so much to matters of pure statistics as to medical and public health questions, studied with such expert statistical aid as may on occasion be required."

Dr. LUTRARIO insisted on the necessity of obtaining a maximum result from the proposed preliminary enquiry. First it would be necessary to recommend the doctors to give special attention to the drafting of the death certificates for children a few weeks old. It would be well to point out to them that the preliminary enquiry was not confined exclusively to the static branch of statistics but that it also dealt with the dynamic branch. For the first weeks, records should be kept daily. For the first four months they should be made weekly, and, finally, for the period from four months to one year they should be made monthly.

Dr. CHODZKO supported the proposal of Sir George Buchanan, all the more so as it was in conformity with the resolutions of the Assembly.

The resolution was adopted with the amendment proposed by Sir George Buchanan.

Resolution VII : *Unification of Registration of Infant Deaths.*

Resolution VII *was adopted.*

The PRESIDENT, speaking on behalf of the Health Committee, thanked the experts who had assisted at the Conference on Infant Welfare.

258. School Hygiene : Draft Programme of Enquiry submitted by Dr. Tsurumi.

Dr. TSURUMI presented his memorandum (Annex 118), which concluded with the following draft resolution :

"The Health Committee,

"In view of the interest there would be in a study of school hygiene, and the great importance and value of this modern health activity :

"Decides to instruct the Medical Director to collect information for a comparative study of school health programmes and for the study of certain special problems of school hygiene, such as nutrition and recent experience in the prevention of certain infectious diseases, for report to a subsequent session."

Dr. RAJCHMAN said that this proposal had already been submitted twice. It should, in his opinion, be carried into effect without delay, all the more so as it was very similar to certain resolutions of the Conference on Infant Welfare which had been adopted.

The Secretariat might submit a preliminary report at the next session of the Committee.

Dr. JITTA thought that these resolutions were a natural sequel to those dealing with infant welfare and that the resolutions, taken together, formed an inseparable whole. He wondered whether it would not be preferable, in order to avoid confusion, to take them up when the Committee had dealt with the questions relating to infant welfare.

Sir George BUCHANAN had reason to believe that Dr. Tsurumi's proposal would be sympathetically considered by the school medical service in England. In putting it into execution, an effort should be made to avoid burying the Health Committee under the enormous mass of documents and reports which had been written on this question. The most useful suggestion would seem to be that doctors experienced in school hygiene should be convened at an appropriate moment to meet — in London, for example — at a conference which would be partly a conference in the proper sense of the term and partly an interchange. When their work was completed, the local doctors might organise visits and demonstrations in their respective districts.

Dr. TSURUMI thought that the interchange was an extremely useful method of developing school hygiene, but, though it was extremely interesting, it would not in itself suffice. There were certain American and English experts who were specially interested in this question and were prepared to assist in carrying out the draft resolution.

Dr. RAJCHMAN said that the Secretariat had already collected a considerable amount of information of exceptional value from international bodies dealing with this question. The analysis of the various recommendations was, however, very complicated, and it was almost impossible to extract anything definite. The advantage of the resolution of Dr. Tsurumi was that it recommended a practical attack upon the problem. A beginning might be made with the study of the prevention of infectious diseases and a study of the food question. If the Health Committee would entrust the matter to him, he would, in agreement with Dr. Tsurumi, present a study of these two questions at the next session.

Dr. CARRIÈRE emphasised the importance of studying the question of sports, not from the point of view of their advantages but from the point of view of the disadvantages and risks which might result from their abuse.

The resolution of Dr. Tsurumi and the proposal of Dr. Rajchman were adopted.

259. Draft Resolutions referred to the Health Committee by the Assembly during its Seventh Ordinary Session.

Dr. RAJCHMAN read the three resolutions submitted respectively by the delegations of Cuba, Czechoslovakia and Uruguay and referred to the Health Committee by the Assembly on September 24th, 1926 (Annex 120).

The text of the first resolution was as follows :

"The Second Committee, in conformity with the resolutions adopted by the Assembly at its fifth and sixth ordinary sessions on the subject of infant mortality and the protection of children, requests the Council to ask the Health Committee to consider to what extent it could, at a suitable time, enlarge its scheme of international enquiry to include other problems of eugenics."

Dr. Rajchman said he would point out that certain delegations, particularly the British delegation, had insisted, in the Second Committee, that the Assembly should leave the Health Committee free to decide upon its own programme of work.

He would observe, in regard to this first resolution, that the delegation of Cuba had agreed to give it a form which was fairly elastic. He thought that the Health Committee would agree in considering that the time had not yet come for carrying it into effect.

Consideration of the first resolution was postponed.

The second resolution, submitted by the delegation of Czechoslovakia, was as follows :

"The Second Committee, considering the importance of physicial culture as a means for preventing disease, and in view of the interest which numerous countries take in that question, asks the Council to instruct the Health Committee to consider the inclusion in the programme of its work of the international investigation of physical culture, including scholastic hygiene, and to decide what special problems may necessitate a comparative study and a co-ordination of national research work and national enquiries."

Professor OTTOLENGHI supported this resolution very warmly and emphasised certain aspects of the question which seemed to him to be of quite special importance and therefore worthy of examination, as was suggested in the Czechoslovak proposal.

First there was the choice of the professors of physical culture and their training. It was time to give to these professors a general and special culture which would enable them to avoid being relegated to a position which was inferior to that of the other professors, with the result that physical culture, which was one of the most important branches of the general training of the individual, often failed to be endowed in the schools with the dignity of which it was worthy.

The second point concerned the method of teaching physical culture itself in schools of all grades. The general opinion of health experts was that physical culture should begin as soon as possible, but there was usually a lack of agreement concerning what was meant by physical culture and, as a consequence, concerning the programmes to be followed in respect of this teaching.

Finally, there was a third question, which seemed to him of great importance, namely, that of physical culture in the universities. This question had perhaps already been settled in England and in the United States, and was in process of being settled in Germany. In many other countries, however, the university, which was open, in part, to the principal sports and athletics, offered no opening for real physical culture, which was of much more general importance and should find a place in the universities if it were to receive from high officials, political men and the great leaders of public life all the support and the means of extension which were necessary with a view to the development of the health conditions of the peoples.

Dr. CARRIÈRE said that sport was a special branch of physical culture. Unhappily, it very often tended to take a pre-eminent place, and its exaggerated development was attended with serious disadvantages. Practised to excess, it seriously affected those who indulged in it, and this danger should be very carefully examined. Professors of physical culture and doctors had a great deal to learn in this field.

Professor NOCHT supported this observation. There was in this direction an excessive development which the Health Committee should endeavour to moderate. It was advisable to undertake a study of the matter and to convene school doctors in order to submit proposals for avoiding the serious disadvantages to which attention had been drawn.

Sir George BUCHANAN said that this was an important question of preventive medicine. He was somewhat impressed by the wide scope of the draft resolution and wondered whether it would not be preferable to get back to the suggestion of the British delegate on the Second Committee. If a particular country had, in any special field, an organisation which it desired to be studied, the best procedure was to invite that country itself to establish the general lines of enquiry. Would it not be possible to invite the Czechoslovak authorities to report in detail on the questions which it would be an advantage to examine from an international point of view ?

Dr. LUTRARIO said that the Assembly during its seventh session had supported the Czechoslovak proposal but had also emphasised the views which had just been expressed by Dr. Carrière, and had contemplated drawing a distinction between physical culture and athletics, in view of the fact that there was a tendency for athleticism to cause physical culture to deviate from its true principles. Statistics received from insurance companies showed that there was a considerable number of diseases of the heart among athletes.

He would point out that Professor Ottolenghi was the moving spirit in a school of physical culture at the University of Bologna, which was a veritable model. The courses lasted several years and ended with the granting of a degree in physical culture.

Dr. RAJCHMAN, in regard to procedure, reminded Sir George Buchanan that last year he had been confronted by the same difficulties as the result of a Czechoslovak proposal upon which, at first sight, it had appeared to be difficult to act. It had been decided to institute a preliminary enquiry, after consultation and examination with the Czechoslovak authorities themselves. The same procedure might be followed in this case.

Professor Ottolenghi had proposed to compare the experience obtained in the various higher educational centres in order that an idea might be formed of the work accomplished, of its extent, of the technical difficulties encountered and of the advantages which might be obtained from international co-operation. Dr. Carrière and Professor Nocht, on the other hand, had raised a question of health policy by emphasising the necessity of controlling physical education and of taking due precautions against certain abuses.

It would seem that the same method might be adopted as last year and that a group of experts might be entrusted with a preliminary examination of the question. It would, of course, be necessary for them to familiarise themselves with the experience of their own countries.

Dr. TSURUMI said that this procedure was satisfactory to him. An institute of physical culture had been established at Tokio, as was stated in his report upon school hygiene.

Sir George BUCHANAN said that if the Health Committee decided to entrust the Medical Director and the experts with an examination of the question, it might be well to appoint one or two members of the Committee as Rapporteurs or to adjourn this subject until the new committee had been appointed.

Dr. RAJCHMAN observed that, hitherto, members of the Committee had rightly been ppointed in order either to follow technical conferences or to direct them. In this case, owever, all that was proposed was an examination which would result in the submission of report to the Committee. He thought that the Committee might rely on him in this case.

Sir George BUCHANAN said that, if the matter were made one of confidence, he could not ısist. He had thought, however, that, from the outset, members of the Committee like rofessor Ottolenghi, Professor Nocht and Dr. Carrière might participate in the enquiry.

The PRESIDENT thought that the Health Committee might adopt the proposal of Dr. :ajchman, who would, of course, keep in touch with the members of the Health ommittee who had spoken on this question.

The third resolution referred for examination to the Health Committee was as follows :

"The Second Committee, having taken note that the International Economic Conference's plan of enquiry is to include an examination of the problem of nutrition (document A.24.1926.II), points out the interest which would attach to the supplementing of this enquiry by a study of the problem from the standpoint of race improvement. This study should take into account, in particular, the work of the Health Organisation regarding infant mortality, as well as the reports by the Japanese Institute of Research into nutrition problems included in the publications of the Health Committee."

Dr. RAJCHMAN said that the delegation of Uruguay had explained to him the scope of is proposal. In certain countries of South America the question of food supply had a ırticular importance, as their wealth was based on the export of meat and cereals.

This problem had important economic aspects and would be examined by the International :onomic Conference. The delegation of Uruguay, however, had insisted on the importance the health aspects of the question, and it had stated that it was not asking for an immediate quiry and that it was content to draw the attention of the Secretariat to this question in der that it might be kept in mind.

The Committee noted the proposal.

Sir George BUCHANAN took this opportunity, before the Committee concluded its discus-ons on these resolutions, to state that he had been present at a meeting of the Second Com-ittee of the Assembly at which Dr. Lutrario had given an account of the work of the Health ommittee. He would like to say how very much he had appreciated this account.

0. Trachoma : Supplementary Report by Dr. Lutrario and Dr. Jitta.

Dr. LUTRARIO submitted a report (Annex 119) intended to complete the document which . Jitta and he had submitted at the May session.

The various legislations and the epidemiological and social data were difficult to compare d did not enable the progress of the campaign in the countries of Europe to be ascertained. he present enquiry dealt with twenty countries. He was asking the Health Section to com-ete it in order that all the aspects of the question might become apparent.

This document contained, among other things, a survey of the position as to prophylaxis Italy. Out of 120,000 pupils in Sicily, 5.5 per cent had been attacked. The number of ecial dispensaries had been raised from 156 to 196. Schools and sanatoria had been estab-ihed in order that courses might be given for doctors and with a view to defining the principles making an early diagnosis. At the end of the document there was a list of countries in ıich it was thought it might be useful to collect information.

The PRESIDENT said that the Committee was glad to have this report, which was full useful information. It would be submitted to the Office international d'hygiène publique, ıere it would be more thoroughly discussed.

Dr. JITTA thanked Dr. Lutrario for the task which he had accomplished and associated nself with the request which he had made. The present diversity of the methods employed ulted in a loss of labour and money, and a meeting of experts might frame certain general es which would contribute to the progress of prevention and treatment.

Dr. TSURUMI accepted with pleasure the request for supplementary information, which Japanese authorities would do their best to satisfy.

Sir George BUCHANAN reminded the Committee that the same procedure had been followed the Office international in dealing with scarlatina, with results which had been very isfactory.

EIGHTH MEETING.

Held on Tuesday, October 19th, 1926, at 10 a.m.

Present : All the members of the Committee with the exception of Professor Cantacuzène, Dr. Chagas, Surgeon-General Cumming, Dr. Granville and Dr. Alice Hamilton.

261. Examination of the Draft Report to the Council on the Work of the Eighth Session of the Committee.

The draft resolutions relating to the work of the eighth session were read.

Resolution I.

The resolution was adopted.

Resolution II.

Dr. RAJCHMAN stated that the Secretariat had on the previous day received a letter from the Belgian Colonial Office intimating that the Belgian Ministry for Foreign Affairs was examining the possibility of supporting the enquiry for a further six months, its duration having originally been fixed at twelve months.

Moreover, a letter from the British Foreign Office had been received stating that the British Government had applied to the Administrations of the Sudan and the British African Colonies with a view to obtaining from these Administrations for 1927 a contribution equal to one-half of their contributions for 1926, it being understood that the contributions thus requested would be final, and that the other Governments concerned would also make further proportionate contributions.

The resolution was adopted.

Resolutions III *to* VI.

Resolutions III *to* VI *were adopted.*

Resolution VII.

Sir George BUCHANAN explained the sense in which he desired this resolution to be adopted. The Smallpox and Vaccination Commission would have to choose from among the various experts those who were most suitable for the work which was now ready for expert consultation. Subsequently, the Commission would confer with other experts at its discretion — for example, those specially interested in the meningitis question, which was not yet ready for further discussion. In any case, it would be for the Commission itself to take the decision.

The resolution was adopted with various amendments.

Resolution VIII.

Professor Léon BERNARD emphasised the importance of collecting documents dealing with the various legislations. The question had been much studied in France, and if it had not been possible to make a general investigation, this was owing to a lack of information as to the regulations in force in the small towns. It was impossible to conceive of an investigation into health in schools without investigating medical inspection in schools.

M. VELGHE agreed. It was not, however, sufficient to collect existing regulations. It was necessary to see how they were applied in practice. In Belgium, inspection of schools was organised under the law, even in the smallest villages, but the application of the law varied greatly from one commune to another. All those who were familiar with the question knew the difficulties presented by the organisation of the inspection of schools in the country. He would ask the Medical Director not to lose sight of his suggestion.

Sir George BUCHANAN observed that, for this reason, it had seemed to be advisable to contemplate a conference of competent persons in order to deal with this question by discussion rather than by documentation.

M. VELGHE explained that, in his view, it was not a question of asking the administrations of various countries in what way the regulations in question were applied but of asking them if they could include in the material sent printed documents concerning the application of the regulations in force.

As regarded the proposed commission, probably the future Health Committee would appoint it at some future date. The need for such a commission would certainly become apparent when the necessary information was available.

Dr. RAJCHMAN explained that the Secretariat was at that moment considering the possibility of increasing its archives by the creation of a new section which would, as far as possible, contain all the laws relating to health.

The suggestion of M. Velghe might be carried out in the following manner. In the *Year-Book* for 1926 the administrations which had consented to collaborate with the Section would be invited to devote some paragraphs to the question.

M. VELGHE proposed that the Medical Director should send to the members of the Committee from time to time a provisional catalogue of the archives to which he had referred. Perhaps this would, at a given moment, encourage the health administrations or even the members of the Committee to consult them.

Dr. RAJCHMAN thought that the Section would be able to send the catalogue to the members of the Committee, at the same time asking them for suggestions.

This proposal was approved.

The resolution was adopted.

Resolution IX.

Dr. RAJCHMAN proposed to add a second paragraph to the resolution, and, at the request of Professor Léon Bernard, gave his reasons for this addition.

The report of the conference of experts had been discussed in detail. It had become apparent that the question had a special interest for Latin America. It was impossible, however, to undertake an enquiry dealing with all the countries of this continent, and it had therefore been decided to confine it to certain of them. The five or six experts appointed would be invited to begin their investigations. When their work was sufficiently advanced, that was to say, in five or six months, these experts would be convened, perhaps at Montevideo, in order to compare the results obtained and to prepare a report.

The resolution was adopted with the additional paragraph proposed.

Resolutions X *and* XI.

Resolutions X *and* XI *were adopted.*

Resolution XII.

Professor Léon BERNARD felt it necessary to draw the attention of the Committee and the Medical Director to the risks involved in the dispersion of the work in the field of infant welfare. There was a clear tendency to study separately the various aspects of this problem, and abuses had occurred in certain directions owing to the failure to co-ordinate the enquiries and to regulate the various measures of application. It would be indispensable, when the various studies came to be compared, that they should be harmonised.

Dr. RAJCHMAN agreed with Professor Léon Bernard as to the execution of the measures to be taken. It was indispensable to adopt a special resolution on the subject of physical education, as a resolution on this point had been adopted by the Assembly.

The resolution was adopted.

Resolution XIII.

Adopted.

Resolution XIV.

Dr. LUTRARIO, on behalf of Dr. Jitta and on his own behalf, submitted a draft resolution on trachoma.

Sir George BUCHANAN wondered whether this resolution was not somewhat too general in character. It might be inferred that the enquiry was now to be pressed in all countries, the majority of which had not replied to the questionnaire. In his opinion, the enquiry should be limited to the countries which were particularly interested in the question. He associated himself with the draft resolution, if he might interpret it in this manner.

Dr. LUTRARIO approved the interpretation of Sir George Buchanan. It was stated in the draft resolution that the work would be done in the sense indicated in the report, which meant that the proposal was to make the data homogeneous and to continue the enquiry in certain countries.

The resolution was adopted.

The report as a whole was adopted (Annex 121).

22. International Conference of the Red Cross on Health Conditions in the Merchant Marine : Note by Dr. Madsen.

The PRESIDENT summarised as follows the proceedings of the International Conference of the Red Cross on Health Conditions in the Merchant Marine, held at Oslo from June 28th to July 4th :

"The Health Organisation of the League of Nations was represented at the above Conference by Dr. Madsen and Dr. Norman White. The Conference was attended by representatives of the International Labour Office, the International Federation of Transport Workers, the International Red Cross Committee, the League of Red Cross Societies, the National Red

Cross Societies, and other interested organisations from China, Costa Rica, Finland, France, Germany, Great Britain, Italy, Japan, the Netherlands, Spain, Sweden and the United States.

"The Conference recorded its appreciation of the initiative taken by the Norwegian Red Cross in the organisation of the Conference and of the work done by that society for the improvement of the health and welfare of merchant seamen. It concluded that there was in nearly all countries a need for a further development of the work on behalf of the general health and welfare of seamen, special emphasis being laid on the dangers from tuberculosis, venereal diseases and tropical diseases.

"The Conference recommended that bureaux should be established in seaports throughout the world in close touch with one another, their principal duties being to furnish seamen with information as to where appropriate medical advice and treatment could be secured, and to provide seamen with postal facilities and information concerning the local resources for their recreation and accommodation.

"It was proposed that the League of Red Cross Societies should invite the National Red Cross Societies of maritime countries to take the initiative in the establishment of these bureaux in consultation with the shipping and other organisations interested, whose collaboration should be invited in promoting the work of general welfare.

"The Conference further recommended that the League of Red Cross Societies should invite the International Labour Office, the Health Organisation of the League and other international organisations to co-operate in appointing a standing committee to deal with the welfare of seamen and to arrange for expert investigations on certain medical subjects and welfare conditions in general.

"In accordance with this last recommendation, the Director-General of the League of Red Cross Societies invited the Health Committee to nominate a member of the proposed standing committee, suggesting that the standing committee should meet twice a year — if possible, when the Permanent Committee of the Office international d'hygiène publique was in session."

Dr. MIMBELA wondered whether the Committee should not appoint Professor Cantacuzène, who represented the League of Red Cross Societies.

The PRESIDENT thought that the appointment of this very distinguished colleague would be excellent, but asked if, in this special case, it would not be preferable to appoint one of the members of the Committee who was specially competent in matters of maritime health. He would propose Dr. Raynaud, who was a member of the Permanent Committee of the Office international and who had especially studied the very important questions concerning conditions in the Mediterranean.

Sir George BUCHANAN observed that the question had not been placed on the agenda of the session. He had received Dr. Madsen's note only on the previous day. Perhaps it was not absolutely necessary to take an immediate decision.

The PRESIDENT asked if it was necessary to postpone the question to the next session.

Dr. RAJCHMAN thought that the Committee might delegate to the bureau the task of appointing a member.

The PRESIDENT explained that the proposed permanent mixed committee would not meet before all its members had been appointed. The International Labour Office had appointed Dr. Carozzi.

Professor Léon BERNARD reminded the Committee that he was the Medical Adviser of the League of Red Cross Societies, and said he considered that it was important to proceed without delay to the appointment of a representative of the Health Committee. Before the official meeting of the permanent mixed committee, its members might perhaps desire to have an exchange of views among themselves. The question was not of vital importance, and it did not appear that there were any objections to entrusting this mission to Dr. Raynaud.

Sir George BUCHANAN thought that this was an excellent choice. Nevertheless, he was not acquainted with the subject. What would the proposed mixed committee do ? What would be its relations with the Governments ? What would be its powers ? Was the Health Committee competent to deal with problems which would be dealt with by this mixed committee ? He did not, however, object to the question being left to the bureau, which perhaps would permit him to submit observations later on, if necessary.

263. Congress on First Aid in the Event of Accidents.

Dr. JITTA said that he had represented the Health Committee at the Congress on First Aid in the Event of Accidents, which had been held at Amsterdam last September. He would refrain from giving an account of the discussions and decisions of that Congress, which had been truly international, as it had included representatives of Austria, Belgium, England, Norway, Sweden, Denmark, Germany, Spain, Switzerland, Italy, Greece, Egypt, and several countries of Latin America, etc. The success of the Congress was all the more remarkable as its predecessor had been held at Vienna in 1913 and it had been necessary to postpone its convocation until the present year. He would point out that a central institute had been

founded for the collection of documents and the examination of all subjects relating to first aid in the event of accidents. The Secretariat of this international institution was at Amsterdam.

Professor Léon BERNARD drew attention to the information already existing in the United States in regard to accidents.

64. Congress of French-speaking Doctors in North America.

Professor Léon BERNARD gave some information in regard to the Congress of French-speaking Doctors in North America, at which he had been present as delegate of the Health Committee. This Congress had been very remarkable, and the welcome which had been extended to him showed the interest aroused by the Health Committee throughout the world and particularly in Canada.

65. Washington Congress on Tuberculosis.

Professor Léon BERNARD, in the absence of Surgeon-General Cumming, emphasised the importance of the Congress which had been held at Washington and which had confirmed the value of the method followed by the Committee in the study of tuberculosis, a method which was highly appreciated by the Americans. He would point out that the statutes of the International Union had been modified and that, in conformity with the proposal in which it had taken the initiative, the Union would henceforth be universal. It was accordingly to be hoped that the scientists of all countries would be represented on the Union, including the Russian scientists.

66. Imperial Social Hygiene Congress.

Sir George BUCHANAN reminded the Committee that the Imperial Social Hygiene Congress had asked the League of Nations to send a representative to the meeting which this Conference was to hold at Wembley in October of last year in order to discuss the question of the prevention of venereal diseases. At the request of the Secretary-General, he had agreed to represent the Health Organisation, but, as he had not been able to go to the Congress, it had been represented by his colleague Colonel Harrison.

He had not been able to give an account of this Congress sooner because the printed volume containing the records of the meeting had only just appeared. He had received only one copy, which he had placed in the Library of the Secretariat. He hoped that other copies could be put at the disposal of his colleagues, as the proceedings contained several papers of much interest, on the practical side, regarding the prevention and treatment of venereal diseases in different parts of the British Empire, and also in regard to the position in British seaports, where much was already being done.

67. Appointment of a Member of the Health Committee on the Council of Governors of the School of Hygiene and Tropical Medicine in London.

Dr. RAJCHMAN reminded the Committee that, two years ago, it had agreed to appoint one of its members, Sir George Buchanan, to the Council of the Governors of this School. The management of the School had just written to the Secretariat to say that the term of office of the present Governors came to an end on December 31st, 1926, and it invited the Committee to elect a new member. Each of the Governors was re-eligible.

The PRESIDENT said that he was certain that all his colleagues would agree to reappoint Sir George Buchanan.

The Committee agreed.

68. Election of the New Health Committee.

The PRESIDENT said that the term of office of the present Committee expired on December 31st, 1926, and that the question of the election of the new Health Committee arose. He read the provisions laid down for this election in the Rules of Procedure of the Health Organisation. What would be the procedure for the consultation which was provided for between the Permanent Health Committee and the Council of the League ? It would have been desirable to convene the Permanent Committee after the meeting of the Office international in order that proposals might be addressed to the Council. As this method presented difficulties, he proposed that, after the election which would be held by the Committee of the Office international, there should be a conversation with the members of the Committee represented on the Office international, and that the final consultations should be left to the Bureau. Moreover, in view of the approaching departure of Sir George Buchanan for Australia, it would be advisable for the Bureau to be able to come to an understanding with him very shortly. A resolution would authorise the Bureau to act as the representative of the Permanent Health Committee.

M. VELGHE supported the proposal of the President. This would be the best way to ensure that the Committee would be complete at its next session, and for that purpose it was necessary to interpret the Rules of Procedure broadly. Personally, he thought that the best way of framing the proposals to be made to the Council was for the Bureau, after taking into account the nominations of the Office international and the wishes of the various members, and especially after having consulted Sir George Buchanan, to agree on the choice of the names to be submitted to the Council.

Sir George BUCHANAN observed that the interpretation according to which it was for the present Committee and not for the new Committee to address proposals to the Council had come as a surprise to most of the members. Accepting this as the correct procedure, he had no objection to the duty of nomination being on this occasion entrusted to the Bureau. On another occasion, the matter might be arranged so as to give the whole Committee the opportunity of voting. So far as he was concerned, he did not wish to enjoy privileges which were not similarly enjoyed by all his colleagues, though he was glad to note that the interest taken in the question by the British Empire was recognised.

Dr. RAJCHMAN read the following draft resolution :

"The Health Committee,

"In view of the stipulation contained in the agreement with the Office international d'hygiène publique which governs the Health Organisation of the League of Nations ; and

"In view of the desirability of making proposals to the Council of the League of Nations at an early date regarding the nomination of members to be appointed by the Council :

"Decides to authorise the Bureau to make the necessary proposals regarding the nomination of members of the Health Committee to be selected by the Council of the League of Nations."

The resolution was adopted.

269. Date and Agenda of the Next Session of the Committee.

The PRESIDENT suggested that the opening date of the next session should be fixed for February 14th.

The Committee agreed.

Sir George BUCHANAN said that a large number of questions had been referred to the new Health Committee, but they would in the normal course be taken at an ordinary spring session rather than at an extraordinary session. Perhaps it would be an advantage to limit the February session to essential formalities, such as the question of the appointment of assessors and the maintenance or dissolution of the present commissions ?

M. VELGHE thought it was difficult for the present Committee to decide what the new Committee would have to do. He appreciated the value of the observations of Sir George Buchanan. It might be assumed that the new Committee, which would doubtless include some of the present members, would, as far as possible, take into account the recommendation made by Sir George Buchanan.

Sir George BUCHANAN explained that he had raised the question because the President himself assumed that the new Committee would include a certain number of the present members.

270. Close of the Session.

The PRESIDENT said that, before closing the last session of the present Health Committee, it might be interesting to make a retrospective survey of the work which had been accomplished. He obviously could not submit a complete summary. He could, however, affirm that, during the existence of the present Health Committee, the work of the Health Organisation had made great progress. It had gained in importance, and the fact was always more clearly recognised by each Assembly. The Assembly of the League of Nations had, in fact, at each of its sessions, shown its confidence in the Committee by entrusting it with tasks which were continually more considerable and which sometimes went beyond its resources. This proved, at any rate, that the Health Organisation was to-day occupying a very important place.

It was unnecessary to point out that this result was due in the first place to the work done at Geneva, and the gratitude of the Committee was, for the most part, due to its Secretariat.

The Committee was in the habit, at the end of each session, of addressing to its Medical Director thanks which were more and more cordial. If the formula which he used was always the same, that was only because words failed him in expressing the depth of the gratitude of the Committee. He had no need to praise, before his colleagues, the initiative and truly exceptional spirit of organisation of the Medical Director.

It must also be recognised that the Medical Director had known how to choose a staff of the highest ability to assist him, and many thanks were due to the technical members of the Health Section, particularly to Dr. Norman White, to whom the Committee owed the creation of the Bureau at Singapore, which was one of the most important works of the Organisation. He did not wish, however, to forget any of the collaborators of the Medical Director. Although they were few in number, they had carried out an admirable work. It was difficult to believe that the members of the Secretariat had been able to submit to the Committee work of so considerable a volume and so well done.

He thanked also the technical Commissions, whose task had developed proportionately as the work entrusted to the Committee had increased. He would thank their Chairmen and their experts. The work of the Committee would not have had so much importance without their talent and their zeal.

Finally, he thanked the members of the Health Committee themselves, even those who, at the beginning, had shown some doubt as to the importance of the work of the Committee but who now had come to appreciate its value. There had gradually developed among the members of the Committee real sentiments of friendship, and its discussions had become continually more cordial.

As President, he would thank all the members of the Committee for having assisted him. Thanks to their assistance, his task had usually been an extremely easy one.

He might have attempted to describe the work to which the new Health Committee would have to devote itself, but it was better that this duty should be left to the Committee itself. He would confine himself to thanking all the members of the Committee for the friendship which they had shown to him.

M. VELGHE said he was certain that the present occasion, which was the last day in the life of the present Health Committee, would leave in the minds of its members a feeling not of regret but of real emotion. The President had said that he had not wished to look back on the work accomplished. He regretted that there was not at the disposal of the Committee a document showing the importance and extent of all the questions with which it had dealt. Nevertheless, the Committee had the feeling that its work had been fruitful and that the President had very justly thanked the Secretariat, the members of the Commissions and the members of the Health Committee for the work done. He had justly, also, emphasised to what extent the work of the Committee had been appreciated both by the Assembly and by persons outside.

The President of the Committee, however, had been too modest. He had not given sufficient value to the share which he had taken in the work of the Health Committee. He had said that his task as President had, in general, been easy, but M. Velghe would venture, as a member who had been very closely associated with him for five years, to state that in reality the task of the President was not always easy — that it was often difficult ; that, in any case, it had been considerable and that it merited the very special gratitude of the Committee. It was precisely because he had seen the President at work every day during the sessions of the Committee that he desired, from the bottom of his heart, to bear witness that he had been a most useful — an indispensable — instrument in ensuring the progress of the work. Thanks to the President, there had prevailed among the members of the Committee an atmosphere of courtesy, cordiality and friendship, as he had known how to give their dealings and discussions a character of distinction and excellence such as was worthy of a society of gentlemen.

In conclusion, he would express the wish not only that, in the new Health Committee, the present members would meet again as far as possible but that those among them who formed part of the next Committee would again be able to secure Dr. Madsen as their President.

The PRESIDENT said that he was extremely touched by the very kind words addressed to him and that he thanked all his colleagues.

Professor Léon BERNARD said he would ask to be excused for addressing the Committee and not leaving it under the impression left by the words which had just been uttered. There was among the members of the Committee a man who, by the side of the President, had rendered services which were more considerable than those rendered by anyone else. He was referring to M. Velghe. It would not be just to allow the somewhat eventful existence of the first Health Committee to come to an end without paying a special tribute to the distinguished services of M. Velghe and without thanking him for what he had done. The work accomplished by the President was inseparable from that done by the Vice-President. If the President might be likened to the presiding genius, M. Velghe had been his guardian angel. His collaboration had been highly useful to the President, and for that reason M. Velghe should be associated with the President as regards the compliments and the feelings of gratitude which had just been expressed on behalf of all the members.

M. VELGHE said that he was somewhat embarrassed by the words of his friend Professor Léon Bernard, but would wish only to remember that these words were a proof of the sympathy of Professor Léon Bernard and of all his colleagues for himself and also of the feelings of affection which existed between himself and the President of the Committee.

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ANNEX 108.

REPORT OF THE MEDICAL DIRECTOR ON THE WORK DONE SINCE THE SIXTH SESSION OF THE HEALTH COMMITTEE

(*May-October* 1926).

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1. I have had the honour to communicate to the Committee the reports of Viscount Ishii on the work of the sixth and seventh sessions of the Health Committee, which were approved by the Council of the League on June 7th and on September 2nd respectively.

I have also communicated to all the Members the following documents:

May 5	C.268.1926.	Report on the Work of the Sixth Session of the Health Committee (Resolutions).
» 20	C.H./E.P.S./103.	Voyage collectif d'étude organisé par le Comité d'hygiène dans le Bassin de la Méditerranée, du 10 novembre au 24 décembre 1925. Rapport d'ensemble du Dr. Raynaud. (French only.)
June 5	C.268(1).	Report on the Work of the Sixth Session of the Health Committee (completed).
» 18	C.H.479.	Note concerning current events.
» 19	C.H.476.	List of printed publications.
» 24	C.H.481.	Meeting of the Expert Committee on Oral Vaccination against Cholera, held on June 4th, 1926, at the Pasteur Institute, Paris (Minutes).
» 29	.....	Contribution à l'étude générale du paludisme en Syrie, par les Docteurs Delmas et Trabaud (dédié à la mémoire des Drs. Darling et Lothian et de Mlle. Besson). (French only.)
July 7	C.H.490.	Conference in Melbourne, December 1926, on health problems in the Pacific Islands. (Copy of letter received from British Foreign Office.)
» 9	C.H.488.	Correspondence exchanged between the Health Section and Dr. Alexander Mitchell as to the enquiry into tuberculosis among natives in South Africa.
» 12	C.H.491.	Memorandum with regard to the Darling Memorial Prize fund.
» 15	C.H.478(1).	Draft Agreement presented by the Bureaux of the Office international d'hygiène publique and of the Health Committee of the League of Nations to their two Committees.
» 17	C.H.493.	Creation by the University of Paris of the new Degree of " Malariologist " for physicians.
» 23	C.252.M.96.1926.	Minutes of the Sixth Session of the Health Committee (April 26th-May 1st, 1926).
» 23	C.H.495.	Trachoma in Italy (Distribution). Report by Dr. Lutrario.
» 28	C.H./Malaria/58(1)	Rapport sur le voyage d'études de la Commission du paludisme en Espagne (13 août-7 septembre 1925). (French only.)
Aug. 11	A.22.1926.III. C.H.494(1).	Report on the Work of the Seventh Session of the Health Committee, held in Paris on June 19th and 20th, 1926.
» 21	C.440.M.170.1926.	Minutes of the Seventh Session of the Health Committee, Paris, June 19th and 20th, 1926.
» 25	C.H./P.E./2(1).	Conference of Experts on Infant Welfare to be held in Geneva on September 27th, 1926. Provisional agenda.
» 26	C.H.284(1).	Summary of the Report on Tuberculosis Statistics addressed by Dr. S. Rosenfeld (Vienna) to the Health Committee of the League of Nations in April 1925.
Sept. 2	C.H./Cancer/8(1).	Quelques considérations sur la statistique de la mortalité par cancer en Suisse, par le Dr. Carrière. (French only.)

Sept.	3	A.6.1926. Extract No. 4. A.6(*a*).1926. Extract No. 4.	Chapters concerning the Health Organisation extracted from the Report and Supplementary Report to the Seventh Ordinary Session of the Assembly of the League of Nations on the Work of the Council, on the Work of the Secretariat and on the Measures taken to execute the Decisions of the Assembly.
»	6	C.H.343. Vols. I and II.	Code de l'hygiène publique dans le Royaume de Belgique. (French only.)
»	8	C.H./Cancer/16.	Note on the Reliability of Inter-Local Differences in Mortality from Cancer, by Dr. Major Greenwood.
»	9	C.H.496.	Note transmitting a copy of the " Décret du 19 juillet 1926 concernant l'hygiène et la salubrité publique au Congo ".
»	10	C.H.497.	Note transmitting an invitation to attend the 89th Congress of the Association of German Biologists and Physicians, to be held in Dusseldorf, September 1926.
»	14	C.H.498.	Note concerning current events.
»	14	C.H.499.	Provisional agenda of the Eighth Session of the Health Committee, Geneva, October 13th-20th, 1926.

2. The Committee will be glad to learn from the resolutions of the seventh ordinary session of the Assembly and from the Report on the Work of the Health Organisation that its activities have received the entire approval of the Assembly. I should like particularly to emphasise the decision taken with regard to the provision made in the Budget of the League for the expenses of the Singapore Bureau of Epidemiological Intelligence for the year 1927.

3. As the two extracts from the general report of the Secretary-General relating to the activities of the Health Organisation complete the Annual Report for the year 1925, there only remains for me to present a short summary of what has been done since the month of May.

The Committee will perhaps desire to discuss these different activities under the following headings:

A. The Service of Epidemiological Intelligence and Public Health Statistics and the Singapore Bureau;

B. The Interchanges of Health Personnel;

C. The Health Insurance Enquiry;

D. The International Rabies Conference;

E. The International List of Causes of Death.

I am presenting to the Committee special notes on each of these questions.

4. In accordance with the resolutions of the April session, Dr. Raynaud will present a report as to the possibility of collecting epidemiological information from certain health administrations in Africa.

Sir George Buchanan will present a report on the work of the Cancer Commission. This Commission will meet on October 11th, concurrently with its Statistical Sub-Committee.

Dr. Lutrario will present a progress report on the work of the Malaria Commission. This Commission has been convened for the morning of October 13th.

I am transmitting to the Committee a note on the progress of the studies and investigations of the Smallpox and Vaccination Commission. The President of this Commission will present a report on this subject.

I have already communicated to the Committee the report of Dr. Duke, President of the International Sleeping-Sickness Commission.

The group of experts on Infantile Mortality will meet at Geneva from September 27th to 29th and I hope to be able to communicate its report before the opening of the session of the Health Committee.

The interchange of Port Medical Officers of the Baltic and North Seas is now proceeding under the direction of Dr. Jitta, the final conference having been convened to Geneva for October 11th and 12th.

The tour of the Malaria Commission in Sicily will extend from September 28th to October 11th, and the Members of the Commission will be able to arrive in Geneva in time for the session of the Health Committee.

The Permanent Standards Commission will meet at Geneva on October 11th, 12th and 13th. At the same time will take place a Conference of the Directors of Institutes and Laboratories who have undertaken, on the invitation of the Health Committee, experimental research on anti-dysenteric and anti-tetanic sera.

On the invitation of Professor Nocht, the German members of the various technical Commissions of our Organisation will meet in conference at Geneva on October 11th and 12th.

C. H. 501.
Annex (a).

THE SERVICE OF EPIDEMIOLOGICAL INTELLIGENCE AND PUBLIC HEALTH STATISTICS.

1. During the past half-year the following countries have been added to the list of those regularly supplying us with epidemiological information : Albania, Chile, China, Costa Rica, Luxemburg, Peru, Anglo-Egyptian Sudan and Transjordan.

2. The fact that the Section has begun to receive information concerning the prevalence of epidemic diseases in China is a significant development. This information has been supplied by the National Epidemic Prevention Bureau at Peking.

In June 1925, letters were addressed by the Bureau to leading practitioners of Western medicine in all the eighteen provinces of China and in Manchuria asking them for information regarding the prevalence of the chief communicable diseases in their respective districts. The replies to these letters form the basis of the reports issued by the bureau. The diseases reported on were selected in accordance with the requirements of the Singapore Bureau.

The reports are received monthly; geographic considerations and the insufficiency of modern means of transport are sufficient explanation of the fact that the information is three months in arrears when despatched from Peking, a delay by no means great in view of the special difficulties involved. This new development is worthy of every encouragement.

3. The time elapsing between the termination of the reporting period in the different countries and the date of despatch of the data to Geneva still varies greatly; this largely depends upon the notification systems in force. The periods covered in the returns of infectious diseases emanating from different countries also lack uniformity — 47 countries send weekly reports, eight ten-daily, ten half-monthly, and 69 monthly reports. The adoption of a uniform period of reporting, similar to that adopted by the ports of the Far East, would be a great convenience and would increase the utility of epidemiological statistics.

The following table shows that the reports from many administrations are being received with increasing promptitude. Colonies for which data are obtained through a Colonial Ministry are not included.

A. *Countries from which weekly, ten-daily or fortnightly reports are received.*

Country	Letter reaches Geneva	Average days between end of reporting period and receipt in Geneva		Country	Letter reaches Geneva	Average days between end of reporting period and receipt in Geneva	
Europe :	in days	1925	1926		in days	1925	1926
Austria	2	40	26	Northern Ireland	2	9	8
Belgium	1	15	15	Italy	1	30	36
Bulgaria	2	16	14	Netherlands	1	9	9
Czechoslovakia	2	30	28	Poland	2	38	26
Danzig	2	12	12	Saar Territory	1	19	18
England and Wales	1	9	10	Scotland	2	8	6
Finland	5	27	26	Kingdom of the Serbs, Croats and Slovenes	2	39	14
Germany	1	26	19	Sweden	3	19	20
Hungary	2	35	12	Switzerland	½	12	10
Irish Free State	2	6	6				
Africa :							
Algeria	3	14	14	Sudan (Anglo-Egyptian)	8	—	16
Egypt	6	19	14	Tunisia	3	10	10
Southern Rhodesia	22	29	30	Union of South Africa	19	32	31
America :							
Ecuador	26	34	34	United States	10	21	26
Asia :							
Formosa	28	43	43	Philippine Islands	27	45	47
India	15	55	48	Siam	25	51	44
Iraq	13	25	36	Shanghai	28	40	40
Japan	30	50	40	South Manchuria Railway Zone	31	42	40
Java	24	74	59	Transjordan	11	—	30
Kwantung	31	42	40				
Palestine	10	46	24				
Australasia :							
Australia	28	62	53	New Zealand	33	43	42

B. *Countries from which monthly reports are received.*

Country	Letter reaches Geneva	Average days between end of reporting period and receipt in Geneva		Country	Letter reaches Geneva	Average days between end of reporting period and receipt in Geneva	
	in days	1925	1926		in days	1925	1926
Europe:							
Albania	3	—	27	Latvia	3	44	38
Denmark	2	24	24	Lithuania	3	35	32
Estonia	3	17	17	Norway	3	23	29
France	1	28	28	Roumania	3	109	59
Greece	3	38	26	Russia	3	110	87
America:							
Canada	10	74	66	Mexico	16	51	46
Chile	32	—	61	Panama Canal Zone	20	43	54
Costa Rica	21	—	41	Peru	18	—	36
Asia:							
China	30	—	133	Syria	10	—	36
Korea	30	60	58				

The following Health Administrations kindly forward preliminary data which in many cases are available a considerable time before their publication in the national bulletins:

Europe:

Albania
Bulgaria
Czechoslovakia
Danzig
Denmark
Estonia
Finland
France
Greece
Hungary
Irish Free State
Italy
Latvia
Lithuania
Poland
Roumania
Russia
Saar Territory

Africa:

Algeria
Anglo-Egyptian Sudan
Egypt
Southern Rhodesia
Union of South Africa [1]

America:

Canada
Chile
Costa Rica
Dominican Republic
Ecuador
Haiti
Mexico
Panama Canal Zone
Peru

Australasia:

Australia

Asia:

Korea
Dutch East Indies
Formosa
Iraq
Japan
Kwantung
Palestine
Persia (Teheran)
Philippine Islands
Shanghai
Siam
South Manchuria Railway Zone
Syria and Grand Lebanon [1]
Transjordan

The Medical Service of the French Colonial Office kindly supplies the Section with copies of telegrams regarding the prevalence of plague, cholera, yellow fever and other serious epidemics in all French colonies.

5. *The Weekly Record.*

The *Weekly Record*, of which twenty-six numbers had been issued up to September 23rd, consists of two parts:

A. The regular weekly telegraphic report received from the Singapore Bureau which gives the number of cases and deaths from plague, cholera and smallpox, and infected rats found in the 112 ports served by the Bureau. To this are appended the names of the ports which have remained free from these infections during the week, and of the ports from which no returns may have been received in time for publication.

B. Information regarding plague, cholera, yellow fever, typhus and smallpox extracted from official returns received at Geneva during the week ending the day before issue.

That the *Weekly Record* has been of service to Health Administrations is shown by the fact that it is constantly quoted in those publications of national Health Services which contain epidemiological information for foreign countries.

6. *The Monthly Epidemiological Report.*

No important change has been made in this publication since the last meeting of the Committee; each number continues to contain about 70 pages.

[1] Telegraphic information regarding the prevalence of plague is also received for these countries.

7. The Annual Report on the Prevalence of Infectious Diseases.

The report for 1925 is somewhat wider in scope than the two previous volumes and contains, in addition to data for all diseases which are notifiable in such countries, statistics of births, deaths, infant mortality and deaths from selected causes in large towns. Meteorological returns are also given for a number of towns. Practically all Health Administrations verified the statistics for 1925 and previous years before publication, revised tables having been received from 58 countries as compared with 42 and 24 in the two previous years. The British Ministry of Health and the French Colonial Office kindly verified the data for their colonies and mandated territories. Tables for the Belgian Congo were kindly furnished by the Belgian Colonial Office, tables for Cyrenaica and Tripolitania by the Italian Colonial Office and tables for Hawaii and Porto Rico by the United States Public Health Service.

The tables referring to the causes of death in the various towns were verified partly by the respective municipal statistical offices and partly by the Health Services of the countries concerned.

The general review contains a rather more detailed survey of the situation regarding each of the epidemic diseases than it was possible to give in the two previous annual reports. It may be mentioned that a considerable amount of information concerning the prevalence of leprosy throughout the world is included in this review, which contains also a short survey of the trend of tuberculosis and of infant mortality.

8. *The Singapore Bureau* now receives and distributes weekly telegraphic information regarding the prevalence of plague, cholera and smallpox, and any other unusual epidemic manifestation, in all important ports of Asia, Australasia and on the east coast of Africa, from which such information is available. A considerable number of ports also report on plague infection among rats and several give weekly total mortality rates from all causes.

One hundred and twelve ports now report regularly as compared with 87 ports in April last and 47 in October 1925. The area thus served by the Bureau extends from Alexandria and Capetown in the west to Honolulu and Papeete in the east.

The considerable cost involved by this system of telegraphic transmission of epidemiological intelligence is being reduced by an increase in the number of stations broadcasting the information by wireless telegraphy. In addition to the broadcasting from Saigon, Malabar (Java), Bombay and Sandakan, which was already in operation at the time of the April meeting of the Committee, the weekly bulletin of the Bureau is now also being broadcasted every Friday from the stations of Madras, Calcutta, Karachi and Shanghai. A number of administrations have informed the Bureau that they can pick up regularly this information and therefore can dispense with the weekly table.

Other information received regarding the movement of infected ships, quarantine notifications, pilgrim ships and the movement of emigrant labour forces is published by the Singapore Bureau, together with current epidemiological information, in the *Weekly Fasciculus*, of which 80 numbers have appeared. This fasciculus also contains a summary of general epidemiological reports received from the countries served by the Bureau, as well as the weekly mortality rates and weekly rainfall records for about twenty cities.

It has been possible by means of this information to follow the progress of the serious cholera epidemics which have occurred in the Far East during the last year.

The Bureau's collection of information regarding the ports in the area is growing. By the end of the year, the Director hopes to have up-to-date statistical information as regards every port served by it and charts and photographs of all the quarantine anchorages and quarantine stations in the Bureau's area.

A new edition of the "AA Cable Code" (168 pages) has been prepared by the Singapore Bureau and circulated to the various administrations concerned. The new code, which is trilingual, contains a much larger number of phrases concerning matters of public health interest than the old edition. It will be employed for the Bureau's communications from October 1st.

This code is specially designed for the area at present served by the Bureau and no code symbols for ports and localities outside this area are contained therein. A supplement is under preparation whereby the code can be made to serve the needs of other parts of the world.

Steps are being taken to convene the next session of the Advisory Council of the Bureau in the end of January 1927. At the last session the members were asked to obtain the views of their Governments regarding the constitution of this Council; no expression of opinion has been received either in Singapore or Geneva from any member regarding this matter, so, for the present, the Council will be constituted as heretofore.

Dr. Brooke, the Director of the Bureau, proceeds on long leave in November. Before his departure, he will write a report on the activities of the Bureau during the current year. This report will be circulated as early as possible to members of the Advisory Council.

It is hoped that the Advisory Council at its meeting in January will be able to put forward budgetary proposals not only for 1927 but also for 1928, so that the latter may be considered by the Health Committee at its spring session along with its own financial requirements for that year. This is all the more necessary in view of the inclusion by the seventh ordinary session of the Assembly of a contribution to the funds of the Singapore Bureau in the budget of the Health Organisation.

The Advisory Council will at its next session have before it proposals regarding co-ordination of research in the East on important questions of international concern. The investigation into the efficacy of buccal vaccination against the intestinal group of infections will be further considered, and it is hoped that recommendations will be made as to the work that can be done with regard to buccal anti-cholera vaccination on the lines laid down at the expert meeting held in Professor Besredka's laboratory in Paris in June last.

With regard to plague, Dr. Wu Lien-Teh has put forward tentative proposals regarding an investigation in Manchuria which will also be discussed.

9. In the light of the preceding remarks concerning the work of the Epidemiological Intelligence Service and more especially of its Singapore Bureau, it may be of interest to consider how far that work would satisfy the requirements of the International Sanitary Convention of Paris, 1926, or what modifications of or additions to the work would be entailed, when the Health Organisation's collaboration with the Office international d'hygiène publique is arranged on the basis of the " Draft Agreement " adopted by the Sixth Session of the Health Committee.

In spite of the fact that all information supplied to the Health Section by administrations is given voluntarily and not imposed by a Convention, the Singapore Bureau to all intents and purposes is already carrying out many of the obligations imposed on the " Office" by the Convention for the large and important area which the Bureau serves.

It would be convenient to summarise the obligations of signatory countries towards the Office international d'hygiène publique and the obligations of the latter towards signatory countries.

The " Office " is to receive and disseminate information concerning:

1. First cases of plague, cholera, yellow fever and fresh outbreaks of smallpox and typhus (Article 1).
2. Locality where disease has appeared ; date; number of cases and deaths; extent of outbreak; (plague) rat-plague; (cholera) cholera-carriers; (yellow fever) stegomyia index; and measures taken (Article 6).
3. Progress of epidemics and measures taken to prevent extension and export of infection (Article 4).
4. Rat-plague (Article 6).
5. Cessation of infection (Article 12).
6. Measures imposed on arrivals from infected territory (Article 16).
7. Sanitary equipment of ports (Articles 14 and 50).
8. Regional agreements (Articles 9 and 57).
9. Deratisation measures (Article 28).

The Singapore Bureau already satisfied most of the requirements of 1, 2, 3, 4 and 5, which are concerned with the first appearance of the disease, progress of epidemics, rat-plague and the cessation of infection; but its attention has been confined, as regards telegraphic information, to the prevalence of diseases in ports. Action under 6 (Measures imposed on arrivals from infected territory) has hitherto been confined to the publication in the *Weekly Fasciculus* of the Singapore Bureau of official quarantine notifications of different Governments. A good deal of work has been done by the Singapore Bureau to collect the information called for by Articles 14 and 50 (Sanitary equipment of ports), though no steps have yet been taken to disseminate this information to other countries in the area. The Singapore Bureau has not been concerned with regional agreements (Item 8), but the Health Organisation of the League has already done some work along this line. No systematic attempt has been made to collect and publish information concerning deratisation activity in the different ports of the world (Item 9) other than that contained in the report of the Mission to the Far East and in the studies made of this question during the Mediterranean interchange.

From the above it will be seen that, in so far as the area served by the Singapore Bureau is concerned, the Health Organisation could undertake, on behalf and in the name of the Office international, all the conventional duties imposed on that body without any increase of personnel and without incurring any appreciable additional expenditure. In practice, only a slight addition to the present length of the weekly broadcast would be entailed, even when the Convention is in full operation. Moreover, the cable code of the Eastern Bureau is well adapted for purposes of the Convention.

Information which the " Office " or bureaux acting on its behalf will have to disseminate telegraphically will consist chiefly of information concerning the first appearance of infectious diseases, including rat-plague, and of a weekly statement concerning the cases and deaths reported in the chief ports. Most of the other information described above could conveniently find a place in either weekly or monthly printed reports. The *Weekly Fasciculus* of Singapore and the *Weekly Record* and Monthly Reports issued by the Epidemiological Intelligence Service in Geneva, with but slight additions — chiefly concerning measures taken to combat epidemics and prevent the export of infection — appear to be indicated as the most useful medium for the dissemination of this information on behalf of the Office international. The *Bulletin* of the Office international would doubtless continue to publish the text of regional agreements and quarantine regulations on which the measures taken by the various administrations against ships from infected ports are based.

The annual report on the sanitary equipment of ports, called for by Articles 14 and 50, could conveniently be a special publication; regional bureaux, such as that of Singapore, would be in a position to assist the " Office " in collecting this information from their different spheres of activity.

Other regional bureaux might perform duties analogous to those now being done by Singapore in the other regions of the world. In this connection it might be mentioned that periodical information regarding the appearance and progress of the diseases treated by the Convention is regularly sent to the Health Section in Geneva by nearly all administrations by mail, and information concerning the first appearance of these diseases is sent by telegram by certain administrations.

Information received by the various bureaux could be exchanged telegraphically each week and a complete weekly report for all parts of the world could be broadcasted by each.

10. Statistical Handbooks. — The following statistical handbooks have been prepared by Dr. Major Greenwood and Major P. J. Edge: *Official Vital Statistics of Portugal*, which is in the press and will appear shortly; the *Official Statistics of Czechoslovakia* is ready for the press The statistical handbooks for Hungary and Italy are being revised by the authorities of the respective countries. The manuscript of the statistical handbook for France has just been received.

The statistical handbook for the Scandinavian countries (Denmark, Norway, Sweden, Finland and Iceland), prepared by Professor Westergaard, including a chapter on the statistics of the Baltic Republics, is in the press. The translation from the original languages of a large number of forms employed by the various countries has delayed its publication.

11. Statistical Committee. — The Health Committee may wish to refer the examination of the replies received from Governments in regard to the Revision of the International List of Causes of Death to a small expert committee composed of the Directors of the central medical or statistical offices of England and Wales, France, Germany, Italy, Scotland and the United States, under the chairmanship of such a recognised authority in medical statistics as Professor Westergaard, of Copenhagen.

Statistical questions coming before the Health Committee are either of a methodological or of a more administrative character. While the first type of problem can be handled either by a commission or by the permanent staff of the Health Organisation or by outside experts selected for their special competence in the particular problem, there is every advantage in securing the advice of a committee as experienced as the one suggested on statistical questions of a rather administrative character, before they are submitted for the deliberation and decision of the Health Committee.

C. H. 501.
Annex (b).

INTERCHANGE OF PUBLIC HEALTH PERSONNEL.

A. Interchanges since the Sixth Session of the Health Committee.

The following programme of interchanges has been carried out since the Sixth Session of the Health Committee (April 26th to May 1st, 1926), as notified to the members of the Committee:

1. The interchange in Denmark;
2. The interchange of sanitary engineers in Great Britain;
3. The interchange of the combined type (Netherlands, Belgium, France and Switzerland);
4. The interchange in the basins of the Baltic and the North Seas.

The Interchange in Denmark.

The interchange in Denmark opened at Copenhagen on May 27th and ended at Geneva, where a final conference was held from July 1st-3rd, 1926. The programme had been arranged by the Danish Administration so as to make it possible to study the organisation and working of those Health services in Denmark which are of particular interest from the point of view of rural hygiene. With this object in view, the members of the collective study tour were chosen from among health officials of the following countries:

Bulgaria,
Cuba,
Czechoslovakia,
Estonia,
Germany,
Great Britain,
Hungary,
Latvia,
Norway,
Kingdom of the Serbs, Croats and Slovenes,
Spain,
Sweden,
Union of Socialist Soviet Republics,
United States of America.

The interchange commenced with lectures given to the participants at Copenhagen, followed by visits to certain health institutions of that city, such as the Statensserum Institute, the Finsen Institute, the municipal and State hospitals, etc. Visits were then paid to the health institutions of Nyborg, Svendborg, Silkborg and of the towns of Aarhus and Loegstor, the members of the party finally returning to Copenhagen.

The participants received a most friendly and hospitable welcome, and the Committee will desire to express its warm thanks to the Danish Health Authorities for the trouble which they took to enable the officials travelling under the auspices of the Health Organisation to obtain the maximum benefit from their stay.

2. *Interchange of Sanitary Engineers.*

This collective study tour, which was confined to civil engineers attached to Health Administrations, took place in Great Britain from June 21st to July 20th. The maximum number of officials to be chosen from among the candidates whose names were submitted for this interchange was limited to eighteen. The officials chosen belonged to the Health Services of the following countries:

Argentina,
Austria,
Belgium,
Denmark,
Finland,
France,
Germany,
Greece,
Hungary,
Italy,
Netherlands,
Norway,
Poland,
Roumania,
Sweden,
Union of Socialist Soviet Republics,
United States of America,
Uruguay.

A series of conferences was first held in London, after which the members of the party attended the annual conference of municipal engineers at Bristol; the participants were then divided into groups of five members, who spent a fortnight in Birmingham, Liverpool, Sheffield and in Scotland respectively. While in London, the officials had the opportunity of attending the jubilee celebrations of the Royal Sanitary Institute, to which they were invited by the President of the Institute. The programme of their activities, which was arranged by a committee under the chairmanship of Mr. Sandford Fawcett, of the British Ministry of Health, included visits to the various water supply installations, inspections of the sanitary organisation of a port and of hospital construction work, examination of schemes for the building of houses and of plans for the development of towns, studies of the measures for the utilisation of refuse and, finally, visits to model villages.

I should like to mention the fact that the Minister for Health, Mr. Neville Chamberlain, received the participants both at the beginning and at the end of the interchange. The Committee will desire to express its warm thanks to the Minister for Health, the President of the Royal Sanitary Institute and our eminent colleagues of the County Councils and of the municipalities of the United Kingdom, for the manner in which they received those who took part in this interchange. The success achieved has suggested the possibility that it may be renewed next year if budgetary conditions permit, in order to meet the wishes of the many candidates presented by the various Health Administrations of the States members of the League of Nations who could not be accepted on the occasion of the first interchange.

3. *Interchange of the Combined Type.*

As the Committee will doubtless remember, this interchange was in the nature both of a series of individual missions and of a collective study tour. The Health Administrations of France, Belgium and the Netherlands selected as participants officials employed as inspectors in charge of departments in these Administrations. The number of participants was strictly limited to ten (three French, four Belgians and three Dutch).

The interchange took place in the summer, beginning on July 18th at Amsterdam and ending with a final conference at Geneva on August 24th and 25th, 1926. In accordance with the new plan of this interchange, the participants were able to employ the journey to the point of assembly in making individual visits to institutions of a general public health character in which they had a special interest. The programme was established in such a way as to include general public health activities having a practical and immediate interest for each of the participants, these activities having been selected by the directors of the various Public Health Administrations, who desired that the participants should acquire practical information with a view to making changes or innovations in the services of their own countries.

The subjects on the programme were: the inspection of schools, the campaign against tuberculosis (after-effects of sanatorium treatment): disinfection (value of terminal disinfection), health insurance (relations between general hygiene and health insurance) and public health propaganda.

The members of the interchange attended lectures in each country on these subjects and then proceeded on their own initiative to study a selected subject. The final conference at Geneva showed clearly that the participants had acquired definite practical ideas and had collected information of real value. Dr. Thierry, head of the Disinfection Service of the city of Paris, Professor Silberschmidt, of Zurich, and Professor Rochaix, Director of the Disinfection Service of the Département du Rhône, took part in the discussions on the invitation of the Health Organisation, and delivered recapitulatory lectures on disinfection from the scientific and practical points of view. An official of the Basle Health Administration also came to Geneva in order to reply to questions put by the members who had previously visited that city and studied its Health Insurance Department. The Health Committee will no doubt desire to thank the Health Administrations of the countries which were visited, namely, Holland, Belgium, France and Switzerland, for the trouble which they took in drawing up the very interesting programmes carried out and for the warm welcome which the participants received. It will also desire to thank the eminent lecturers who took part in the discussions at the final conference.

Interchange in the Baltic and the North Sea.

Sixteen officials took part in this collective study tour, belonging to the following Health Administrations:

Belgium,	Germany,	Netherlands,
Denmark,	Great Britain,	Norway,
Finland,	Latvia,	Sweden,
France,	Lithuania,	Union of Socialist Soviet Republics.
Free City of Danzig,		

Dr. Jitta agreed to undertake the direction of the group. The study tour began at Riga, where the participants received a warm welcome from the Prime Minister, the Minister for Social Welfare and the Director of the Public Health Department, Dr. Augusts Petersons. The party, were able to realise that, in spite of the devastation caused by the war, the Latvian authorities courageously seconded by the whole of the population, have undertaken and actively promoted an extensive scheme of reconstruction. Thanks to the general activity, the port of Riga is becoming increasingly important and this renewed prosperity is enabling sanitary and other installations to be rapidly developed. Visits to the port, to the water supply works, to the leper-hospital, etc., showed that sanitary work is being actively prosecuted, and will shortly place Riga on a level with the best-equipped ports of the Baltic and the North Seas. From Riga the group will proceed to Liepaja (Libau), Danzig, Stettin, Copenhagen, Hamburg, Bremen, Amsterdam, Rotterdam, Antwerp, Havre, Southampton, London, Liverpool and Newcastle, and will hold a final conference at Geneva. The programme of this tour has been planned for the period from September 12th to October 12th. The representative of the Free City of Danzig is acting as secretary to the group and will on this occasion fulfil the functions of a temporary member of the Health Section. The programme has been drawn up with the help of all the Health Administrations of the countries to be visited, who have been good enough to give us the dates on which visits could take place. The Health Committee will desire to thank all the authorities who have given effective help in the matter, thus ensuring the entire success of this study tour, the detailed preparation of which has necessitated very careful work on their part.

The object of this tour is to study the administrative organisation of the ports of the Baltic and the North Seas, their sanitary equipment, the methods employed for the deratisation and fumigation of vessels and warehouses, etc. In addition, the gathering together of officials belonging to various countries will facilitate the establishment of effective liaison between the different authorities concerned.

B. — Programme of Interchanges for 1927.

The Committee will probably remember that we have at our disposal for 1927 a credit of 35,000 francs only, representing the contribution from the Rockefeller Foundation together with the sum of 150,000 francs from the Budget of the League. The programme for next year is therefore necessarily more limited than was that for last year, when the amount of the Rockefeller subvention amounted to double the grant for 1927.

1. The programme of the new scheme adopted for the collective interchange which is to take place in Great Britain will cover a period of six weeks, the first of which will be devoted to lectures at the Ministry of Health and to visiting health institutions in London. The four succeeding weeks will be devoted to practical courses carried out by groups of two participants, each of different nationality, who will be attached to the departments of the Medical Officers of Health in the following areas: Liverpool, Glasgow, Birmingham, Bradford, Hornsey and Berkshire. During the last week all the participants will meet in London for further discussion with particular reference to the problems studied at the research institutes.

The following programme contains full details:

Provisional Programme of Study Tour of Public Health Officers in Great Britain.
(February 21st to March 27th, 1927.)

Sunday, February 20th.	Arrival of participants in London.
Monday, February 21st.	10 a.m. Registration at the Office of Mr. G. S. Elliston, M.A., Executive Secretary to the Society of Medical Officers of Health, 1, Upper Montague Street, Russell Square, London W.C.1.
February 21st–26th.	London. For two days the participants will attend lectures at the Ministry of Health descriptive of the whole scheme of central health administration in Great Britain. One and a-half days will be spent in visiting institutions and laboratories of the Metropolitan Asylums Board in connection with the control of infectious diseases. One day will be devoted to the study of the water-supply schemes of London with the Metropolitan Water Board, and one day will be reserved for housing schemes in and around London.

Sunday, February 27th. Participants leave for the provinces to be attached in pairs to health departments in the following areas:

Liverpool, large city and port;
Glasgow, large city and port;
Birmingham, industrial centre;
Bradford, industrial centre;
Hornsey, residential borough adjoining London;
Berkshire and rural areas and small towns, combined sanitary districts.

The participants will be allocated to those areas likely to be most instructive from the point of view of the special requirements of the Public Health Service they represent. In each of the areas the whole scheme of health administration will be seen, including office routine, school medical work, industrial hygiene, maternity and child welfare, tuberculosis and V.D. schemes, fever hospital administration, water supplies and sewage disposal, housing schemes and health insurance.

Sunday, March 27th. The whole party reassembles in London for the final week, which will include inspection of meat and food markets, port sanitation, and visits to various institutions in connection with medical research, eugenics, industrial psychology, tropical hygiene, naval and military hygiene, bacteriological laboratories, etc.

Saturday, April 2nd. Closing conference at the Ministry of Health, London. Departure for Geneva.

Monday, April 4th. GENEVA. Participants meet at the Secretariat of the League of Nations for the final conference, which will probably last three days.

The number of participants invited is limited to 12, but a few supplementary places would be reserved should any Health Administrations express the desire to send officials at their own expense.

Invitations have been sent to the following Health Administrations: Argentina, Belgium, China, France, Germany, Greece, Italy, Kingdom of the Serbs, Croats and Slovenes, Latvia, Nicaragua, Poland, Roumania, Sweden and Switzerland. Invitations have also been sent to the Health Administration of Japan and the Federal Service of Public Health in the United States, but we were unable to offer to pay the travelling expenses in these two cases.

The interchange will last from February 20th to April 6th, 1927, and will end with a final conference at Geneva.

2. *International Continuation Course in Public Health.*

Certain Directors of Public Health Services in various countries of Europe have suggested that it would be useful to introduce yet another type of interchange, developing that period usually devoted to conferences into an international continuation course in public health. This course would be followed by a practical stage, enabling participants in the interchange to study in the various countries the special subjects for which their respective administrations have made them responsible. In selecting the countries to be visited, it would be necessary to consult the Health Administrations by which participants have been nominated in order to discover the problems with which they are specially concerned and the foreign countries in which they desire their officials to make a comparative study of these problems.

It has also been pointed out that, if this international course were given in French, a considerable number of health officers could take part as the knowledge of this language is fairly widespread among our medical colleagues. Professor Léon Bernard has assured us that the Institute of Hygiene of the Faculty of Medicine in Paris would be ready to organise such a course on behalf of the Committee by inviting—apart from French professors—Austrian, Belgian, British, Danish, Dutch, German, Italian and Polish professors to assist. Each of these experts would deal in French with the subject of his own particular research.

Lecturers would expound the theory and practice of present public health. They would deal with the main health problems and the solution which has so far been found for each in their own countries.

Should the Committee accept this scheme, the course could begin on January 17th, 1927, in Paris. The following programme might be suggested: during the first six weeks two lectures would be given in the morning, and the remainder of the day would be devoted to practical study of the public health services in the city of Paris and in two or three French departments; the six following weeks would be devoted to a stay in various countries (Belgium, Denmark, Germany, Great Britain, Holland, etc.), for the study of special problems, under the direction of the lecturers and in small groups.

The number of candidates admitted would have to be limited to a maximum of 25. We could grant 12 scholarships of a value of $100 per month each, and also pay travelling expenses under the conditions at present in force for participants in interchanges. Such a scholarship would only be granted to an officer whose Health Administration undertook to send a first candidate at its own expense.

Should the proposed course yield the expected results, the possibility of organising a second course in 1928, in the German language, could be considered.

It is proposed to issue invitations to the following countries: Brazil, Bulgaria, Czechoslovakia, osta Rica, Cuba, Estonia, Finland, Germany, Greece, Hungary, Kingdom of the Serbs, Croats nd Slovenes, Latvia, Lithuania, Paraguay, Poland, Roumania, Union of the Socialist Soviet tepublics and Uruguay.

3. It has not yet been possible to settle the programme for a collective interchange which it hoped will be organised in Germany during 1927.

4. As in 1926, we are reserving individual scholarships for Far-Eastern countries.

5. A credit is also being reserved which is intended for the development of interchanges in ıe countries of Latin America—more especially between the Institutes of Tropical Medicine and ɔcial Hygiene—and also for the development of individual missions. It is hoped within the ext few months to be able to draw up a detailed programme, based upon the correspondence at resent being exchanged with the Health Administrations of those countries.

6. The interchanges of specialists might be used to contribute to the investigation of certain oblems included in our programme. We have considered, for instance, the possibility of an terchange which might be reserved for experts in physical culture in order to meet the wish the Czechoslovak delegate as expressed at the seventh ordinary session of the Assembly. Another ight be utilised for the study of health insurance, or any other question raised by the chnical commissions.

7. The remainder of the available funds might be used for individual missions reserved for ıropeans and possibly to cover the initial cost of the organisation of a collective interchange in itish India, the usefulness of which was pointed out by the Indian delegation to the last Assembly.

C. H. 51.
Annex (c).

PUBLIC HEALTH ADMINISTRATION AND HEALTH INSURANCE.

1. In a report [C.H. 421], on the progress of this enquiry, to the Sixth Session of the Health mmittee, reference was made to the studies in progress in Budapest, Cologne, Prague, Vienna d Warsaw. It was noted that public health officers nominated by the chiefs of their Public alth Administrations were engaged in preparing reports on the preventive activities of health urance funds and on the inter-relationships of these and other municipal health agencies based a plan prepared by these public health officers and members of the Health Section. The plan s divided into three parts, the first relating to health insurance organisations, the second to icial and private health agencies and the third to hospitals. Complete reports have now been eived from Budapest, Cologne, Prague and Vienna, and Part I has been completed for Warsaw. e public health officers engaged in the study met at Geneva on September 13th to 18th inclusive study the reports, discuss the progress made and to amend and improve the plan of study in light of experience gained during the course of the enquiry. In addition to the complete reports, ich are available for reference in the original, brief summarised reports were prepared by each ɔlic health officer on the preventive activities and inter-relationships of health insurance funds l municipal health agencies.

The plan of study, amended and clarified in the light of the experience gained during the vey, will be submitted to the Committee.

2. The report on the preventive activities and relationships of sickness insurance organisaıs to the public health services, hospitals and private health agencies in Germany as a whole ɔeing prepared by Dr. A. Grotjahn, Professor of Social Hygiene in the University of Berlin, l should be ready for the first session of the Health Committee in 1927.

3. The present studies have been restricted to countries in which sickness insurance is igatory for certain classes of the population. In a number of European countries where sickness ırance is not obligatory the necessity of incorporating preventive principles into the system been recognised and developed. There would be considerable interest in a study of one or re areas in such countries along lines already laid down, and it is proposed as a first step to end the enquiry to a district in Denmark.

4. Special attention has been paid to the morbidity records of health insurance organisations he five cities first selected for study. Preliminary investigation has revealed that these do not ɔresent furnish exact information in regard to the illnesses which affect the insured, the records ng incomplete in so far as the diagnosis is concerned. General terms are employed which do furnish definite information in regard to the specific disease existing. And yet health insurance ɔials insist that these records should be exact and definite in order that they may be used as a is for the application of preventive measures, and to enable public health officers to estimate this basis the causes and proportions of morbidity in the community. In Vienna, a committee ɔxperts has been set up to establish a scientific nomenclature for the conditions which are uded under the term "rheumatism". In other countries similar studies have been made, l the Health Committee may wish to afford facilities to these national groups to exchange eriences and to study the documentation of other countries. During the next session of the ernational Labour Conference (May 1927) the International Labour Office intends to suggest t the Conference make a recommendation on the morbidity statistics to be established by lth insurance organisations.

5. In the reports from the five selected cities, particular attention has been paid to the financial considerations relating to medical and public health benefits of sickness insurance organisations, and to the activities of official and private health agencies. The Insurance Services of the International Labour Office have very kindly prepared for us reports on the financial aspects of health insurance in Belgium, Denmark, Great Britain and Hungary, which are now available for consultation by members of the Health Committee.

6. Legislation providing for the enactment, development, consolidation and amendment of health insurance laws is under way in a number of countries. The insurance organisations are yearly increasing the scope and extent of their activities designed to prevent diseases as well as to treat those already existing. An interchange of experience and documentation on an international scale would be of great value to administrations which are desirous of enacting or amending health insurance laws. In this work the Health Committee may desire to be guided by the advice of a small number of experts who might be willing to study and report on certain questions which the Committee would refer to them.

The Committee will remember that it instructed the Medical Director to make a study of this question, in consultation with the Czechoslovak public health authorities, on the basis of the resolution of the last Assembly. The Public Health Services of Austria, Hungary, Poland, Czechoslovakia and Germany have appointed investigators who have made a comprehensive survey of existing medical and sanitary organisations in the territories of Vienna, Budapest, Prague, Warsaw and Cologne, with a view to discovering what relations, if any, exist between the institutions of the health insurance systems and other institutions. These enquiries have now been extended to Copenhagen. In one or two instances the local investigators were hoping to have the assistance of a national committee for the study of methods to be adopted in order to avoid overlapping between the various institutions, and with a view to the best and most economical utilisation of all.

All these surveys and studies were conducted according to the spirit of the Assembly resolution, namely, with the object of discovering how the health insurance system has been, is being or may be utilised for the purposes of preventive medicine. Professor GROTJAHN has agreed to prepare a memorandum on German experience in this respect, and Dr. MCCLEARY, of the British Ministry of Health, will describe the English practice.

The Committee may wish to consider at its next session whether all the documentation resulting from these surveys, as well as the special memoranda, should not be referred to an expert committee composed of leaders of public health, of experienced administrators of health insurance systems and of prominent medical leaders, who would advise the Committee on the questions raised by the Assembly resolution of 1925.

C. H. 501.
Annex (d).

INTERNATIONAL RABIES CONFERENCE.

During its Sixth Session, the Health Committee decided to convene in April 1927, at the Pasteur Institute in Paris, an International Conference on Rabies to which the directors of the chief anti-rabies institutes should be invited. In accordance with this resolution, the Public Health Administrations have been invited to appoint as delegates to this Conference the directors of the principal anti-rabies institutes in their countries. As a basis for discussion, a memorandum will be presented, part of which will be prepared for the Pasteur Institute by Professors Calmette, Marie, and Remlinger and part by the Health Section.

A comprehensive questionnaire has been sent to the principal anti-rabies institutes of the world. Very complete answers to the questionnaire have already (September 15th) been received from France (Institut Pasteur, Lille), Germany (Institut Robert Koch, Berlin; State Lymph Establishment, Dresden), Hungary (Pasteur Institute, Budapest), Italy (Pasteur Institute, Rome), Tunis (Pasteur Institute, Tunis). Additional valuable information has also been received from the United States of America, the Netherlands, Norway, Ireland, Costa Rica and Haiti. In view of the interest taken by the different countries in the problems to be discussed, it is expected that a full documentation will be obtained before the Conference, which will be of considerable value in ensuring its success.

C. H. 501.
Annex (e).

INTERNATIONAL LIST OF CAUSES OF DEATH.

Since the Sixth Session of the Health Committee, replies to the circular letter concerning the Revision of the International List of Causes of Death have been received from the Governments of:

Union of South Africa,
Argentina,
Cuba,
Czechoslovakia,
Japan,
New Zealand,
Roumania,
Switzerland.

The Government of the *Union of South Africa* makes certain suggestions as to the modification f a few titles which would make the list more suitable for local conditions. Other small modi- cations which have already been introduced, to allow for conditions prevailing in South Africa, re described.

The Governments of *Argentina* and *Cuba* have promised to forward their opinions when the esponsible departments of their administrations have completed their examination of the question.

The Government of *Czechoslovakia* states that its Ministry of Health and State Statistical nstitute are carrying out a detailed study of the question, the results of which will be forwarded o the Health Section. In the meantime an abridged list, differing in certain respects, which are illy described, from the International Short List, is used in Czechoslovakia; this abridged list ontains 58 headings.

The Government of *Japan* explains that some additions to the list have been made in Japan meet local requirements. The opinion is also expressed that an international understanding most desirable, first with regard to the inclusions under the different heads and, secondly, ith regard to the primary tabulation of joint causes of death.

The Government of *New Zealand* states that the International List is used in its country in njunction with the American Manual of Joint Causes and that neither the Health Department r the Government statistician have any suggestions to make regarding the revision.

The Government of *Roumania* makes certain detailed proposals regarding the age classifi- tion to be used in tabulating deaths and states its willingness to accept such proposals for revision may be finally approved and adopted by the Health Committee.

The Government of *Switzerland* advocates the collaboration of the International Institute Statistics with the Health Committee in the preparatory work of revision and states that the ternational List is still on its trial. Observations will be made at the end of 1926 or early in 1927 hen the tabulation of data for 1921-25 has been completed.

The Scandinavian report on the revision of the nomenclature has not yet been finally adopted: opy of the preliminary list, provisionally approved by the Scandinavian countries, has, however, en forwarded to the Health Section.

At the Sixth Session of the Health Committee, the Medical Director was requested to enter into ationship with the International Institute and to establish if possible the basis of collaboration tween that Institute and the Health Organisation of the League in the preparatory work of the vision of the International List of Causes of Death. After discussion and correspondence, it s suggested to the President of the International Institute of Statistics that reports and proposals anating from the expert committee which the Health Committee will appoint to deal with this tter might be sent to the International Institute of Statistics for consideration and comment ore being submitted to the Health Committee. This proposal has recently been renewed and eply is awaited. Copies of correspondence exchanged have been given to the members of the nmittee.

In the meantime, the Health Committee may desire to consider the appointment of an expert mittee to whom will be entrusted the preparatory work of revision. In considering this question, hould be borne in mind that many of the problems raised will demand for their solution expert owledge of medical and pathological terminology rather than of statistical procedure and that ministrative questions of considerable importance are involved.

ANNEX 109.

REVISION OF THE LIST OF CAUSES OF DEATH.

TTER FROM THE PRESIDENT OF THE INTERNATIONAL INSTITUTE OF STATISTICS TO THE MEDICAL DIRECTOR.

anslation.]

Paris, August 23rd, 1926.

During the conversation which I had with you and the President of the Health Organisa- n of the League at Professor Léon Bernard's house in Paris, I urged the advantages, h from the point of view of public health and statistics, of co-operation between our two anisations with a view to the revision of the List of Causes of Death. This point had already n mentioned to you by our Secretary-General, M. Methorst.

The nomenclature in question was first prepared by the International Institute of Statis- at its Vienna (1891) and Chicago (1893) sessions. At its Christiania session in 1899, the itute recommended, on the report of our colleague Dr. Jacques Bertillon, that an inter- ional conference should be called to revise the List periodically. It was upon our recom- dation that the French Government consented to convene the Conference in Paris in o. Finally, the preparatory work for the revisions undertaken in 1900, 1909 and 1919 carried out by Dr. Jacques Bertillon, Rapporteur to the Health Statistics Committee he Institute. Accordingly, the International Institute, at its last session, held in Rome, in instructed a Committee, to draw up a report in preparation for the coming revision he List. I considered, however, that, in view of our long experience of this matter, it ht be useful, in preparation for the next Conference, to see whether it would be advisable etain the same bases for the List as those used hitherto, or to change them, and I came he conclusion that the best method of coming to a decision would be to hold a meeting of al numbers of representatives of the Health Organisation and of the International Institute tatistics sitting as a joint committee, on which they could work in close collaboration.

An organisation of this type has been in existence for four years, namely, the Mixed Commission known as "the Committee of Enquiry into Economic Statistical Methods", appointed conjointly by the Economic Committee of the League of Nations and the International Institute of Statistics. Last year again, we set up a mixed Committee with the International Labour Office on the same basis, and this method of co-operation has in all cases given good results. We have found that it had the advantage of never in any way affecting our autonomy, the necessity for which was recognised by the Assembly of the League of Nations in its resolution relative to international statistics passed at its second ordinary session in 1921 ; on their side, the League organisations with which we have co-operated on this basis have had no cause to regret our independence, since it assured them every guarantee from the scientific point of view. Moreover, the Institute merely gives opinions, and the League organisation concerned remains completely free to take any decisions it may see fit and to make allowances in its decisions for any possible considerations of expediency, of which the Governments are frequently, and quite legitimately, obliged to take account.

The foregoing considerations did not, however, appear to you to be conclusive; you considered that, the Health Organisation having been created, the International Institute of Statistics should stand aside, that it was for the Health Organisation to deal with the question of the List and undertake at once its revision without outside assistance, and that the only proposal which you could make would be that the Health Organisation should, as a mark of sympathy for our Institute, appoint one or two statisticians as members of a Committee of experts to be appointed by the Health Organisation itself — a solution which obviously would not result in the joint co-operation which I had in mind between our two organisations.

It was, however, understood, in response to my wishes, that we should see one another later in order to discuss the matter afresh, since you were obliged to remain in Paris for some time longer to attend an international Conference which was sitting at that time. However, on the day on which you were to come and see me, you informed me that you could not keep your engagement, your meeting having concluded late that evening, and, as I heard nothing further from you, although the international Conference went on for several weeks longer, I concluded that you were still of the same opinion, and gave instructions for the resumption by our Institute's Committee of the preparatory work, which I had ordered to be provisionally held up pending your reply. You will, however, realise that I should be glad to know what was finally decided, and should accordingly be grateful if you would give me the necessary information.

(*Signed*) A. DELATOUR,
President of the International Institute of Statistics.

LETTER FROM THE MEDICAL DIRECTOR TO THE PRESIDENT OF THE INTERNATIONAL INSTITUTE OF STATISTICS.

[*Translation.*] Geneva, September 3rd, 1926.

In your letter of August 23rd, you requested me to inform you of the terms of the proposal made by the President of the Health Committee and ourselves during the conversation which we had with you at Professor Léon Bernard's house in Paris.

We told you that the Health Committee, having received, both from the American Public Health Association and from the Directors of the Scandinavian Statistical Bureaux, a proposal for the revision of the List of Causes of Death, decided to include this question in its programme of work. In conformity with the foregoing decision, the Health Committee proposed to the Council of the League of Nations to submit the American Public Health Association's scheme to all Governments and at the same time to ask them to forward any observations which their competent services might see fit to make with regard to the revision of the List of Causes of Death.

In reply to the circular letter sent by the Secretary-General of the League of Nations to the Governments in conformity with the above decision of the Council, various Governments among them the British Government, stated that they fully approved the inclusion of this question on the Health Committee's agenda and undertook to communicate at an early date any observations which they might think it desirable to make.

We further informed you that, since this procedure had already been adopted, the Health Committee proposed to send the Governments' observations to be examined by a small Committee of experts consisting of the Directors of the Health Statistics Bureaux in the principal countries, more especially in the British Empire, who readily accepted this task. We were informed by you that the International Institute of Statistics, in co-operating with governmental international organisations, to which it offered every guarantee from the scientific point of view, was anxious to retain its complete independence ; that it only expressed opinions and that the Health Organisation was free to take any decisions it might see fit and to make allowance in its decisions for any administrative considerations of which the Government might be obliged to take account. We therefore had the honour to suggest, as an effective method of co-operation, that the report to be drawn up by the Committee of statistical experts should be submitted to your Institute for an opinion before being discussed by the Health Committee.

Neither the President of the Health Committee nor myself have ever argued that :

"...the Health Organisation having been created, the International Institute of Statistics should stand aside..., and that the only proposal which we could make would

be that the Health Organisation should, as a mark of sympathy for your Institute, appoint one or two statisticians as members of a committee of experts to be appointed by the Health Organisation itself ".

On the other hand, you were good enough to state that, although the method of o-operation proposed by us was not the one you had in mind, you were nevertheless prepared o examine it, and that you thought that, should our proposal be accepted, the report of ur Committee of statistical experts should be communicated to you in March 1927 so that it ould be examined at the next plenary Conference of the International Institute of Statistics.

I have the honour to confirm this proposal, and I should be grateful to you if you would e so good as to inform me of your views, in order that I may lay our correspondence on the ıbject before the members of the Health Committee at their next session in Geneva on ctober 13th.

(*Signed*) L. RAJCHMAN,
Medical Director.

ETTER FROM THE PRESIDENT OF THE INTERNATIONAL INSTITUTE OF STATISTICS TO THE MEDICAL DIRECTOR.

ranslation.]

Paris, September 22nd, 1926.

I wish first to make good an omission due to a misunderstanding. It was only after y letter of August 23rd had been sent that I received the Minutes of your meeting of April th, and it was only then that I learned that the Health Committee had approved the prinple of co-operation between our two organisations while leaving it to us to examine together e method of this co-operation. I beg you, then, first of all to offer the Committee the thanks the International Institute of Statistics for this decision, the value of which for the success the work undertaken it fully appreciates.

The principle of co-operation between us being thus established, the question of produre remains to be settled. You informed me in your letter of the 3rd instant that the ealth Committee proposed to submit any observations communicated to it by the Governnts for examination by a small Committee of experts consisting of directors of the Health atistics Bureaux in the principal countries, more especially in the British Empire, and you ggested the following as an effective method of co-operation that the report of the Committee expert statisticians should be submitted to the International Institute of Statistics in ırch 1927 for its opinion before being discussed by the Health Committee.

I beg to suggest that the method you propose appears to present certain difficulties.

In the first place, under the statutes of the Institute we are not permitted to submit rectly for discussion by the General Assembly any documents except those drawn up by e of its Committees or (in virtue of an extension of this rule recognised by all general assemes which have met since the foundation of the League) by one of the joint committees set in agreement with other organisations. This again constitutes one of the grounds on ich I proposed the establishment of a joint committee.

Secondly, we would point out that the Health Committee decided to set up a new nmittee of statistical experts, while there already exists in the International Institute of tistics, by virtue of the decision taken at Rome in 1925, a Committee of Health Statistins responsible for the preliminary work for the revision of the List of the Causes of Death. is committee includes among its members eminent medical men under the chairmanship Professor Roger, Dean of the Faculty of Medicine in the University of Paris, and many ts members would probably at the same time be members of the Committee of Statisticians. ey would thus be obliged to examine identical questions in different committees, on behalf the Institute and on behalf of the Health Section respectively, which would result in a most rettable duplication of work.

Thirdly, the method of co-operation proposed by you would be confined to an exchange reports and findings, whereas if representatives of our two institutions could work round same table as a joint committee and exchange their ideas by word of mouth,it would be ier to harmonise their views and more especially to avoid the confusions and misunderstands which so frequently arise in regard to international matters.

For the foregoing reasons, I venture to urge this latter method of co-operation upon and upon the Health Committee. The system of a joint committee is that best adapted our statutes, while it will avoid overlapping and will establish direct contact, the advantages which would appear to be obvious.

I may add that it is the method at present employed for co-operation between ourselves the Economic Committee and also the International Labour Office ; further, the same cedure has just been adopted with the International Institute of Intellectual Co-operation, the new joint committee will meet on November 3rd next.

As you have been good enough to inform me that the Health Committee will meet at ieva on October 13th next, and that you will submit our correspondence to it, I should be teful to you if you would distribute to the members a copy of the present letter, and if you ıld inform me as soon as possible of the resolution taken in the matter.

(*Signed*) A. DELATOUR,
President of the International Institute of Statistics.

ANNEX 110.

REPORT ON THE PRACTICABILITY AND DESIRABILITY OF ESTABLISHING A CENTRE OF EPIDEMIOLOGICAL INFORMATION FOR THE AFRICAN CONTINENT, WITH PROVISIONAL HEADQUARTERS AT ALGIERS.

By Dr. Lucien Raynaud.

I. PREFACE.

At the request of the French delegation, the Assembly of the League, at its sixth ordinary session, adopted the following proposal:

> " The Second Committee, having in mind the gravity and the prevalence of endemic and epidemic diseases in West Africa and the international danger arising therefrom, recommends the Assembly to request the Health Organisation of the League of Nations to study the possibility of establishing a sanitary and epidemiological bureau on the West Coast of Africa. "

During its sixteenth session on September 26th, 1925, the Council of the League asked the Health Committee to examine the French delegation's proposal. On October 14th, 1925, the Health Committee instructed the Medical Director " to enquire and report as to the desirability and practicability of establishing a sanitary bureau for the countries on the West Coast of Africa, basing such report on information secured from the public health administrations interested and from a study of existing conditions obtained on the occasion of the forthcoming interchange of health officers in that area ".

The Governments of Belgium, Spain, France, Great Britain, Portugal and the Union of South Africa were consulted by the Secretary-General of the League. All the replies have not yet been received.

The participants in the interchange, who, between March 20th and May 18th, visited the countries of the West Coast of Africa (Senegal, Gambia, Portuguese Guinea, French Guinea, Liberia, Ivory Coast, Togoland, Gold Coast and Sierra Leone) met at a final conference at Freetown on May 17th, and, although they held no official mandate from their Governments, discussed the desirability of establishing a sanitary bureau for West Africa.

The French participants, supported by several Portuguese and Spanish members, proposed that a sanitary bureau should be created as soon as possible in West Africa; the British delegates were, generally speaking, of opinion that such an organisation, highly desirable though it might be, would be somewhat premature. Finally, the South African representative, in agreement with his colleague from the Belgian Congo, said that questions of African epidemiology could not be limited to the western part of Africa but that it would be very desirable for all the States to receive epidemiological information from all parts of Africa and that consequently the sanitary bureau ought to be pan-African.

This was the view which was generally held among the members of the Health Committee, who met at Paris on June 19th and 20th, 1926. It was held that the epidemiological information would be of greater value if it embraced all African territories, and that this solution would be nearest to the desire expressed by the majority at Freetown. Without prejudging the opinion to be expressed by the various Governments which had been officially consulted, the Committee thought that it would be desirable to pursue the enquiry begun.

The Committee held that it would be desirable, for further precision, to study the kind of work which might most usefully be undertaken by such a bureau if it were established at Algiers.

The Committee has instructed me—and I highly appreciate the honour—to examine the conditions under which epidemiological information might, in practice, be centralised, and to consider the possibilities and difficulties of telegraphic transmission by cable and by wireless.

Finally, it has requested me to conduct an experiment to see how such a bureau might work, that is to say, collect and distribute all information possible on the diseases which at the present time show the greatest tendency to spread throughout the African continent, such as yellow fever, relapsing fever, cerebro-spinal meningitis, plague (which seem to be passing from the west coast towards the equatorial area) or sleeping-sickness (which is particularly common in Central Africa).

As the Sanitary Bureau at Singapore receives information sent from the east coast of Africa from Egypt to the Cape, it was thought to be preferable, for the present, to limit the enquiry, on the one side, to the Mediterranean and Atlantic coastal areas of the continent (*i.e., Northern Africa*, and *Western Africa*) and, on the other, to the territories of *Central Africa*, the idea being to add to the health information, which mainly refers to the seaboard, data on the serious endemo-epidemic diseases which play so important a part in the pathology of this country.

After hearing Viscount Ishii's report at its meeting of September 2nd, 1926, the Council of the League approved this suggestion of the Health Committee. It is of course understood that only after the present report has been discussed and the observations of the Governments interested have been received will the Committee be in a position to make recommendations to the Council at its December session.

I. WHAT SANITARY INFORMATION DO WE AT PRESENT POSSESS RELATING TO THE VARIOUS PARTS OF AFRICA ?

The Health Organisation at Geneva receives its information on notifiable diseases under the ollowing conditions:

1. *Countries sending in weekly reports:*

Basutoland,
Egypt,
Uganda,
Northern Rhodesia,
Southern Rhodesia,
Tanganyika.

2. *Countries sending in reports every ten days:*

Algeria,
Tunis.

3. *Countries sending in monthly reports:*

Algeria, Tunis, Morocco. } *Bulletin sanitaire de l'Algérie.*

French Colonies:

West Africa,
Equatorial Africa,
Madagascar,
Réunion.

French mandated territories:

Cameroons,
Togoland.

} Reports received and transmitted by the Ministry for the Colonies.

British Colonies:

Gold Coast,
Nigeria,
Sierra Leone,
Mauritius,
Nyasaland.

Union of South Africa:

Kenya and East Africa Protectorate:

} *Local Government Bulletin* and *Bulletin of the British Ministry of Health.*

Cyrenaica and Tripolitania (Bulletin of Infectious Diseases of the Kingdom of Italy).

4. Finally, *annual reports* are drawn up by almost all the countries; some supply only nual reports, certain of which, addressed to the Ministries, are not published.

5. The Sanitary Convention of 1912 also prescribes that the sanitary authorities of the mari- ne districts shall, through their Ministry for Foreign Affairs and the Office international d'hygiène iblique in Paris, notify the various Governments of all cases of infectious disease.

It will thus be seen that only those diseases which are regarded as being of importance from e point of view of maritime relations — *i.e.*, plague and yellow fever — are notified direct to e various Governments. Even so, such notification is not always despatched by cable, and it ten arrives after a considerable delay.

The other infectious diseases which seriously affect the African States are, it is true, published the *monthly* and *annual epidemiological reports* of the League of Nations, but they only reach eneva after much time has elapsed, and they then have to be retransmitted from Geneva to ose concerned; five or six months or even more elapse from the date on which the cases first curred [1].

No agreements exist between the neighbouring African colonies for the exchange of information the sanitary situation; it must be admitted that there are practically no regular postal relations tween the various States, and that, though each may possess its own carriage-roads and railways, ry few of these highways run from the territory of one State into that of another.

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[1] The *Epidemiological Bulletin* of July, which appeared in August, gives information on the month of April, and ne information on May. When will the *Bulletin* be received in Tropical Africa ?

We should, however, mention the agreement concluded in 1909 between the Portuguese colony of Mozambique and the Transvaal regarding the recruiting of labour for the mines, which provides for health measures on behalf of labourers crossing the frontier. Rhodesia and Angola also require that precautions shall be taken before they allow their natives to proceed to the mines of Katanga (Belgian Congo).

This question of health preservation measures and the exchange of information between neighbours was discussed and submitted in the form of a very urgent recommendation at the last " Congress of Tropical Medicine " held at St. Paul de Loanda in 1923; a similar recommendation was made by our Committee at its meeting in October 1924 when discussing the Mission which is at present studying sleeping-sickness in Equatorial Africa [1].

With more numerous and better communications, with increasing contact between the various States, the danger, from a health point of view, suddenly appears; measures have to be adopted to prevent the introduction of some infection which is causing havoc in the neighbouring country. In view, for instance, of the recent spread of sleeping-sickness, cerebro-spinal meningitis and relapsing fever, it would seem that migrations ought to be controlled with increasing care.

The publications of the Health Committee, the missions and interchanges which it has organised, the various congresses on tropical medicine at St. Paul de Loanda, Marseilles, and elsewhere, have so aroused public opinion that Governments are gradually coming to take an interest in international health questions. We seem to have now reached a stage when we should provide the various colonies and States of Africa with the means, or at least the possibility, of obtaining up-to-date information on epidemiological facts which may affect their own population. Countries which have relations with Africa should also be informed of any infectious diseases in that continent which may show a dangerous tendency to spread.

III. THE ECONOMIC IMPORTANCE OF AFRICA.

At a time when the high cost of living is becoming a problem in every country—with industrial demands perpetually on the increase—the necessity of deriving the fullest possible benefit from colonies calls for no special pleading. Africa, with its immense territories, possesses unknown wealth; it is still one of the most important centres for the production of raw materials. Various foodstuffs, fruits, wood, textiles, india-rubber, ores, coal, precious stones, radium, etc., are to be found in abundance throughout the black continent.

Relations with Africa are becoming more numerous and intimate and this tendency will certainly become stronger as time goes on. If the European cannot colonise these lands, he can at least take steps to ensure that they shall produce as much as possible. In Africa, the white man, except in a few localities, can do little more than direct the work which is, or should be, carried out by the natives. It is therefore our duty to see that native labour shall be as productive as possible.

Is native labour adequate ? What is the situation in this respect ?

IV. THE DEPOPULATION OF AFRICA.

Endemic and Epidemic Diseases.

It is no secret that, although, generally speaking, their birth rate is very high—40 to 70 per thousand—the black races are not increasing; on the contrary, they show a tendency to decrease and they will even disappear unless measures are adopted and energetically carried out to forestall this disaster. The lack of native labour is keenly felt throughout the continent and is a cause of anxiety to all the States. The Transvaal, for instance, is obliged to obtain 40 per cent of its labourers from the colony of Mozambique. In all the colonies the heavy work of levelling for railroad construction is a problem which is vastly complicated by the difficulty of obtaining a sufficient number of labourers, feeding them and protecting them from infection, quite apart from the additional problem of getting sufficient work from them. The exploitation of forests, mines and the agricultural resources of Africa is seriously menaced.

The causes of depopulation are numerous. For hundreds of years the history of the country has been one long series of invasions, tribal wars [2], slave-trading, periodical famines, and epidemics. Of the latter, sleeping-sickness causes appalling havoc. From 1914 to 1923, in French Equatorial Africa, the population has fallen from 4,950,000 to 3,500,000, mainly as a result of this disease [3]. Sleeping-sickness is one of the main causes of sterility among women and of infantile debility and mortality. Clapier (*Société de Pathologie exotique*, 1920) refers to villages on the banks of the Oubanghi where 35 deaths occurred and there were no births; " in general, six children are born while 21 die, in addition to 40 adults ". As a whole, in the Oubanghi district, where sleeping-sickness is very rife, the death rate is three times as high as the birth rate.

We only quote figures for French colonies, because we possess no definite information regarding other places. We should add that the Government of French Equatorial Africa has not remained indifferent to this peril, since four-fifths of its budget are devoted to public relief.

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[1] The Committee recommends: " It would be desirable for the Governments of the infected countries to afford facilities for Conferences between administrators and medical officers on both sides of the frontier in charge of the campaign against sleeping-sickness. There should be co-operation in order to ascertain what zones are affected, the prevalence of the tsetse fly, migrations and movements of the population, all factors favourable to the communication of the disease, etc. "

[2] " In less than ten years, El Hajj 'Omar caused 6 million human beings to be massacred in the Hausa country; in one district, Rabah, in another, Samory, spread devastation far and wide . . . " (Camille Sabatier, *Le Trans-saharien*. Camillé et Fourniéc, Toulouse, 1922.)

[3] The Congress of Tropical Medicine, Loanda, 1923. — Mme. Vassal, *Natalité et Protection de l'Enfance en A. E. F.*

Moreover, this state of affairs is not confined to French territory; with variations, it is the same throughout the rest of the African continent.

The black population, except along the coast and near European settlements, where it has slightly changed its manner of life, has always been and still is *underfed*. The natives eat little or no meat, little or no fish; their diet consists of a few cereals and fruits. The natives do not endeavour by labour—which they detest—to increase the productivity of their soil; they therefore possess little power of resistance. Unclothed, badly housed, infested by every sort of parasite, they fall easy victims to *malaria, helminthiasis, dysentery, ankylostomiasis, filariasis*, and *bilharziosis* (which latter disease threatens to become as prevalent here as in Egypt) [1]. Finally the *pneumococcus* complicates the slightest pulmonary disorder. There is also the whole range of *children's diseases*, which carry off so many young lives and are fostered by ignorance, superstition and lack of hygiene. Special mention should be made of *infantile tetanus*, caused by an infection of the umbilical cord. *Leprosy, frambesia, craw-craw* and *phagedenic ulcers* also render incapable great numbers.

Then came the infectious diseases introduced by civilisation: *Tuberculosis*, which was formerly unknown, except perhaps in the country bordering on the Sahara whither the Moorish conquerors had brought it; tuberculosis is spreading in the towns and penetrating into the interior. *Syphilis*, too, is spreading rapidly; in certain parts of French West Africa it is estimated that 57 per cent of the population is affected (Nogué). *Alcoholism* is also a product of civilisation.

It is recognised, moreover, that the improved communications which we have established between the various parts of Africa have helped to spread *sleeping-sickness*. The long trains of carriers who accompany explorers and officials making their way into the interior bring the germs to localities in which the disease is unknown but the transmitting insect abundant. A great many centres of the disease have been formed in this way and the situation has become so alarming that all Governments are taking energetic steps to fight the disease.

Migrations and regular changes of habitat among the native races are responsible for the fact that *relapsing fever* has travelled from the shores of the Atlantic to Lake Chad and the borders of the Anglo-Egyptian Sudan, claiming over 100,000 victims along the French Niger alone, while *cerebro-spinal meningitis* has penetrated from the coast to the various States of Western and Equatorial Africa.

Smallpox has also caused much havoc; but in this case the possibility of establishing centres for the production of vaccine and the use of transportable dried vaccine have made it possible to carry on an effective campaign. The danger is decreasing considerably.

Finally *plague* is a disease imported by Europeans. After gaining a foothold in Senegal in 1914, it rapidly spread far into the interior, producing numerous cases and deaths.

V. DISEASES WHICH MAY BE IMPORTED FROM AFRICA.

In addition to the diseases which are more or less peculiar to Africa and which more especially affect the black races — although Europeans are by no means immune — there are other diseases, such as *yellow fever*, to which the natives seem less susceptible or against which they have been immunised but which might constitute a peril for countries in contact with the African continent.

Yellow fever is endemic on the Western Coast and in the eighteenth century claimed many victims among the European population. Outbreaks are less serious at present, but Africa constitutes one of the last centres of this disease in the world, for yellow fever is disappearing from America. The recrudescence of the disease is always a danger, and it may quite well spread to other places and to other countries in the same latitude which offer conditions favourable to the existence of the stegomya.

It is quite possible that other diseases may be imported into other continents. Europe, for instance, not only utilises black labour, but employs coloured troops who may well transmit to Europeans the germs of diseases which have hitherto been confined to the black races. Amœbic dysentery and helminthiasis have gained a foothold in parts of Europe or Northern Africa where they were hitherto unknown; ankylostomiasis, bilharziosis, filariosis and leprosy may also be imported into our countries.

We need hardly dwell on the innumerable forms of pyroplasmoses, trypanosomiasis, cattle plague, etc., which destroy so many herds, and might, with increased contact between Africa and other continents, cause a veritable economic disaster if imported into other countries.

VI. DUTY OF HUMAN SOLIDARITY.

Europe and all civilised nations are bound, in common humanity, to give a thought to the situation of these backward peoples who are being mown down by so many diseases and afflictions. It is true that colonists have endeavoured to mitigate the ills by which they were surrounded, and some they successfully fought down; but never until now have preventive medicine and hygiene possessed such powerful resources.

It is not so very long since we first became acquainted with the various aspects of sleeping-sickness, the conditions of its transmission and the arsenical products by which its ravages can be limited. With other tropical diseases the case is the same.

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[1] França (Congress of St. Paul de Loanda, 1923).

Much has still to be done. The territories are immense; they possess few roads and are difficult of access. One district is divided from another by obstacles such as impenetrable forests and vast marshes. The population is sparse and the health staff, not to mention the resources at its disposal, inadequate for the work which has to be done.

The Council and Assembly have approved the suggestions put forward by the Rapporteur for a mission of enquiry into sleeping-sickness. It was clear that the League of Nations could not abandon to its fate the enormous population of a vast continent. The League had a duty to humanity to fulfil, and it was bound to come forward and assist the efforts of the protecting and mandatory Powers to mitigate both the ills inherent to the land and those which civilisation itself had introduced or allowed to spread.

Far be it from us to propose that the Health Committee should interfere in questions which solely concern the various Governments and health administrations; but the Health Committee can offer its services, its great facilities for centralisation, and publicity to render the campaign which has already been undertaken more effective.

VII. NEED FOR RAPID AND PERIODICAL INFORMATION ON HEALTH.

Surely, by securing exact and rapid information on epidemiological conditions in the various parts of the African continent, the intensity of a given disease and the direction in which it is spreading, the methods employed to combat it and the migrations of population, we shall enable each State to protect itself against possible outbreaks in a neighbouring territory.

Should not the already established international rule for pestilential diseases which threaten ports also become a rule when the same diseases, or others as serious and widespread, develop in the hinterland ?

To information on the number of cases and their increase or decrease, it might sometimes be useful to add a statement on the measures adopted, the new processes employed and the results obtained. A knowledge of the health organisations and scientific work of others may be of great use, quite apart from the fact that it encourages healthy emulation.

We can quote a striking example, in the case of French North Africa. Having had occasion to travel to Tunis, we explained the advantages of the epidemiological bulletins which had been published in Algeria since 1907. Tunis immediately prepared a bulletin, which is published every ten days. Morocco, which has hitherto sent us only fragmentary information, has now decided, in order to co-operate effectively in the work of the pan-African Bureau, to publish a bulletin similar to those which appear in Algeria and Tunis.

The Health Committee will, we are sure, be able to persuade certain African countries to issue similar bulletins and exchange information with other States; we shall thus be creating, for the good of all, health liaison which will open out the way for valuable scientific co-operation.

VIII. CONDITIONS WHICH AN EPIDEMIOLOGICAL INFORMATION CENTRE SHOULD FULFIL.

Apart from the opinion formed at Freetown, a number of Governments have recently expressed their views on the desirability of establishing a centre for health information. The British reply states — without advancing any reasons — that it cannot fall in with the French proposal, but the Belgian, Spanish and Portuguese Governments agree with the proposal for the rapid exchange of epidemiological information, close co-operation between the various territories being the best means for combating diseases and securing the welfare of the populations.

A centralising bureau must fulfil certain conditions which the Belgian Government's reply defines in greater detail than the other replies; it must be chosen with a view to its telegraphic and postal facilities and its railway, air or sea communications.

The Belgian Congo would like the Bureau to be a pan-African one; the other administrations would be content with a special bureau in West Africa.

Spain proposes Monrovia as the Bureau's headquarters, because it is the most central point on the West Coast of Africa and, above all, because Liberia occupies a privileged position as being the only territory in this part of Africa which is not a colony.

Portugal would prefer Dakar, and Belgium, Geneva, on account of the latter's facilities for international communications.

To sum up:

For the creation of a health bureau, general approval, apart from the abstention of the British Government.

For a pan-African bureau, Belgium and South Africa.

For a special West African Bureau, Spain and Portugal.

France had proposed Dakar, a suggestion which is officially supported by Portugal.

IX. THE SITUATION OF ALGIERS AS A CENTRE OF HEALTH INFORMATION.

The Health Committee having, by a unanimous decision, instructed me to consider the possi-ility of establishing the Bureau at Algiers, I will simply furnish a statement on the situation of lgiers as regards the following categories of communications:

(*a*) Sea,
(*b*) Air,
(*c*) Railway,
(*d*) Cable,
(*e*) Wireless,
(*f*) Automobile.

A. Algiers as a Maritime Centre.

Three shipping companies (passenger and mail lines) maintain a regular service between lgiers and *France*. The crossing takes 26 hours; there are eight mails per week in winter and n in summer. In addition, there are regular mail services to Oran, Bougie, Philippeville and ône; once or twice a week from Marseilles, Port Vendres and Cette.

Service with Spanish ports, three mails per month;

Service with Italian ports, five mails per month;

Service with Moroccan ports, 18 to 20 mails per month (six French and three foreign companies aintain this service as some of the vessels touch at Oran);

Service with Tunisian ports, 30 mails per month (13 French companies and more than ten reign cargo lines);

Service with French West African ports, three per month.

It should be pointed out that communications with Spain and Italy are very convenient and quent via Marseilles or via Oran and Tunis.

There are regular sailings to and from the *Near East* five times a month; ten vessels belonging eight French or foreign lines and coming from the *Far East* touch at Algiers; the " Compagnie vraise " has two mails for Madagascar, and the " Nederland " Line has two mail boats which p at Genoa and Algiers.

The vessels of four companies (three French and one Italian) coming from the Atlantic (Europe America) touch at Algiers on their way to the Near or Far East, with two monthly mails each.

In addition, during the winter the port is visited by about 40 large tourist vessels which ply ween America and the British ports and Algiers and the Mediterranean. The daily service ween Algiers and France enables rapid postal communications to be maintained with countries directly connected with Algerian ports. For instance, in addition to the vessels which call at giers and Oran on their way to Morocco and Dakar, seven vessels leave Marseilles every month French West Africa, five mail steamers leave Bordeaux for Morocco and four for Dakar. Five ular mail boats also leave Marseilles for Jibouti, Madagascar or the east coast of Africa.

As regards shipping, Algiers is the *third* most important French port, coming after Le Havre l Marseilles but before Rouen. In 1924, the shipping statistics were as follows:

1.	Le Havre	15,353	(entered and cleared)	
2.	Marseilles	13,607	»	»
3.	Algiers	8,420	»	»
4.	Rouen	8,084	»	»
5.	Oran	7,037	»	»

Bordeaux comes tenth, Tunis twelfth and Bône twenty-second.

In 1925, 4,046 vessels entered the port of Algiers:

From the East	464
From the Far East	285
From the Straits of Gibraltar (Europe, Africa and America)	1,498
From France	929
North African coastwise traffic	870
	4,046

The following tables show the position occupied by Algiers among the principal Mediterranean ports (entries only):

According to tonnage.

1.	Port Said	19,806,823
2.	Marseilles	10,068,061
3.	Constantinople	7,646,550
4.	Genoa	7,200,000
5.	Algiers	6,441,846
6.	Naples	5,288,012
7.	Alexandria	4,276,913
8.	Malta	4,038,249
9.	Barcelona	—
10.	Trieste	2,546,568
11.	Piræus	2,323,705
12.	Salonika	1,427,168
13.	Haifa	—

According to number.

1.	Trieste	9,86(
2.	Marseilles	6,47[illegible]
3.	Piræus	6,25[illegible]
4.	Naples	5,33[illegible]
5.	Constantinople	5,23(
6.	Port Said	5,02[illegible]
7.	Genoa	5,00(
8.	Algiers	4,12[illegible]
9.	Malta	2,89[illegible]
10.	Alexandria	2,69(
11.	Barcelona	2,12[illegible]
12.	Salonika	1,85[illegible]
13.	Haifa	1,21(

Vessels crossing the Mediterranean formerly called at Gibraltar and Malta to take in supplies The natural advantages of Algiers and the facilities granted in this port, have reduced these stop to one. Algiers has become a very favourite port of call for tourist vessels, cargo-boats, etc., whic take in coal, water and supplies.

Algiers has daily connections with countries along the Atlantic seaboard and with the Nea and Far East.

A number of vessels have adopted Algiers as a port of transit for goods and passengers, wh re-embark there for other destinations.

B. Air Communications of Algeria.

The "Latécoère" Company has organised a daily line *from Toulouse to Morocco*, across Spain the aeroplanes fly from Toulouse to Casablanca (1,850 km.) in 13 hours (stopping at Barcelona Alicante, Malaga, Tangier, Rabat).

Two aeroplanes maintain a bi-weekly service between *Casablanca* and *Oran* (with landing at Rabat and Fez).

For some months there was a bi-weekly service between Alicante and Oran; experiment have been made in connection with a line from Barcelona to Algiers, with intermediate landing in the Balearic Islands. But a new organisation has now been started, which maintains a direc service between Marseilles and Algiers. The voyage takes from five to six hours.

An aeroplane leaves *Casablanca* weekly for *Dakar*.

There is a line from *Nice* to *Ajaccio*, which will shortly be extended to Tunis.

Some years ago, the Sahara was crossed several times, the most notable instance being th crossing by the Vuillemin Squadron, during which General Laperrinne lost his life. Since then, othe missions have experienced no difficulty in making this journey, since landing--grounds and suppl depots have been organised. Even in the winter of 1924-25, the Government of French Wes Africa and the administrations of North Africa (including Algeria) made preparations for aeria penetration across the desert; De Goys (1925) and Paolacci (January 1926) travelled through fro the north to the south; Commandant Tulasne (January 1926) flew from the *Niger* to Colomb Bechar and back. Reconnoitring aeroplanes regularly fly from post to post in the south. Th map on the following page shows the air bases and landing-grounds in French Africa.

The Algerian bases are Colomb-Bechar, Algiers, Laghouat, Setif, Touggourt, with landing grounds at Ain-Sefra, Géryville, Jelfa, Constantine, and, for the Sahara, Igli, Beni-Abbes, Agra Ouallen, Ourgla, Hassi-Inifel, Aîn-Guettarar, In-Salah, Tesnou, Tamanrasset.

These posts connect, in the south, with those at Kidal, Taberrachet, Bao, Timbuctoo, Bamah Kayes, Dakar (in French East Africa); in the east with those of Tunis and Gabes (Tunis); in th west with those at Oujda, Taza, Fez, Meknés, Marrakech, Rabat, Mogador (Morocco).

C. Railway Communications.

Excellent carriage-roads connect up all parts of Algeria and the two neighbouring Prote torates. The railway from Casablanca to Tunis traverses the whole of Northern Algeria, whi lines to the interior run south from Philippeville to Touggourt, and from Oran to Colomb-Becha whence convoys leave for the Sudan across the Sahara.

Mails arriving in one of the ports along the coast are distributed by rail and the innumerab motor-bus services all over the colony.

D. Cable Communications.

The following cables connect Algeria with the various Mediterranean and African colonies:

1. *With France:* Algiers-Marseilles, three submarine cables.
   Oran-Marseilles, one submarine cable.
   Philippeville, one submarine cable.
   Bône, one submarine cable.
2. *With Morocco:* Oran-Tangier, one submarine cable.
3. *With the East:* Bône-Malta, two submarine cables.

The last mentioned, which are owned by a British company, pass by Alexandria and serve ıe coast of Africa via Suez, Suakim, Obock, Aden, Zanzibar, and Mozambique. From Mozambique French cable runs to Majunga (Madagascar). From Malta there is a cable to Tripoli, while Tripoli connected with Syracuse by an Italian line. Communications with West Africa pass over the nes Algeria-France and Brest-Dakar, or Oran-Tangier, Tangier-Cadiz, Cadiz-Teneriffe, Teneriffe-t. Louis. Moreover, the land-lines between Algeria, Tunis and Morocco are largely used. There is legraphic communication between Algiers and Casablanca; from Casablanca to Dakar there is French submarine cable.

We need not refer in detail to the telegraphic communications which, by submarine cable, nnect the various States of the West African Coast.

The rates will be found in the universal list; they are calculated in gold francs.

Morocco is connected with France by the Casablanca-Brest cable, the land-lines across the anish zone to Tangier (which are not much used) and the cables Tangier-Oran and Tangier-arseilles; finally, the British Tangier-Gibraltar cable and the Spanish cable Tangier-Ceuta uta-Malaga (Spain).

The *Belgian Congo* has sent us a list of its telegraphic communications.

E. Wireless Communications.

The following map shows the wireless stations which have been set up along the African ast.

The principal stations in North Africa are those at Algiers (Fort-de-l'Eau), thence eastwards Philippeville, Bizerta, Tunis, Cape Bon, Sousse, Sfax, Gabes, Tripoli, Bengazi, Alexandria, and stwards, to Oran, Ain-el-Turk, Melilla, Tangier, Larache, Casablanca, Agadir, Cape Juby, la Cisneros, Port Etienne, Dakar, Bathurst, Sierra Leone, Tabou, Accra, Kotonou, Lagos, rnando-Po, Cabinda, Grand Bassana, Loanda.

We should also mention the special aviation wireless stations: Oran (La Sénia), and Oran drodroplanes), Algiers (Maison-Blanche), Algiers (l'Arba) and Bône.

Algeria also possesses a system of wireless stations connecting the principal points of the ıara with Northern Algeria on the one hand and French West Africa on the other.

The map showing the progress of penetration towards the centre of Africa indicates these ious stations.

They are Bou-Denib, Colomb Béchar, Beni Abbés, Tabelbala, Adrar, Timimoun, El Goléa, argla, Fort Flatters, Fort Tolignac. They may, under an agreement concluded on August 25th, 5, between Algeria and French West Africa, transmit private telegrams to the following posts rench West Africa: Kidal, Timbuctoo, Bamako, Dakar, Atar, Chinguetti (Adrar de Mauritanie); l the following stations in French Equatorial Africa: Tahona, Agades, Zinder, Bilma and zzaville.

In addition to the three stations at Bizerta and those along the sea-coast, there are in Tunis, interior and Sahara stations at Gafsa, Metlili, Médenine, Tatahouïne, Bir Aïoun, Dehibat, net. Morocco has no stations available for private communications, but, according to the ector of Posts, Telegraphs and Telephones, there are stations belonging either to the military, al or air authorities which could, if necessary, communicate with Algeria.

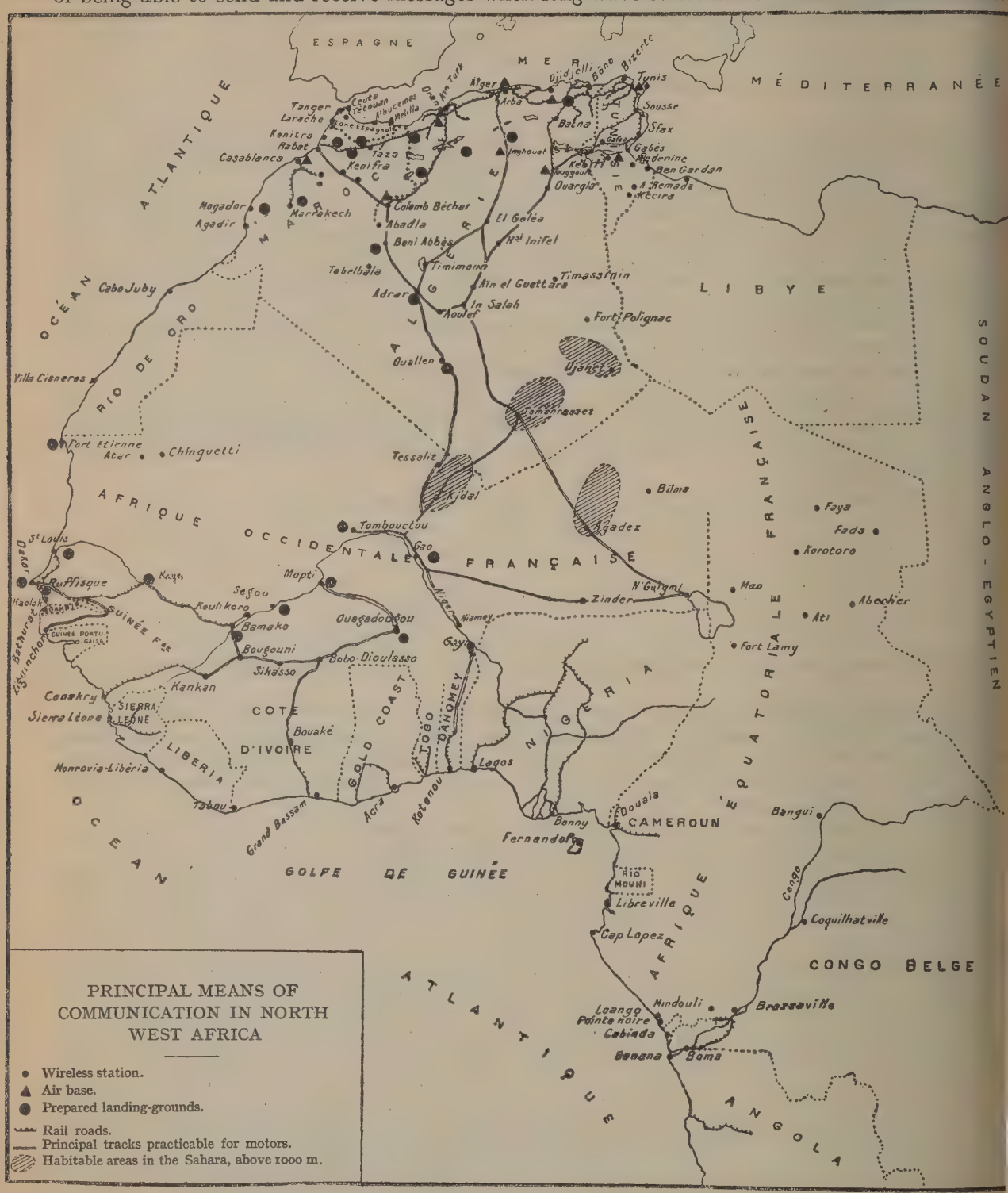
The stations in Southern Algeria and Tunis are mainly used to maintain contact between various occupied districts, to facilitate transport and ensure the safety of caravans, motor voys or air expeditions. Communications are precarious, not so much owing to the atmospheric ms as to the quality of the material and the staff which it is somewhat difficult to recruit these desert areas.

The high-power stations at Brazzaville and Bamako could communicate with Paris and the e European stations. The Arba station at Algiers could doubtless exchange telegrams with Bamako and Brazzaville stations; it is used for aviation and has a goniometrical station blished in 1924 with a force of two kilowatts and a range of 1,500 to 3,000 kilometres.

I think that, apart from certain special cases in which serious epidemiological facts had to be fied urgently, wireless communications would not be of much practical use for the present. n, however, certain that all the authorities would be quite willing to carry out experiments

in transmission, under special conditions to be defined later, to ascertain the possibility of sending official communications, such as health communications, between Central Africa and the North African coast.

The future of wireless is very great. A discovery has quite recently been announced by which all atmospherics can be eliminated; short-wave lengths — a comparatively new line of study — will perhaps soon come into general use. The latter method, by which General Ferrier's laboratory in Paris communicated clearly with Jibouti, is very easy to instal and costs little, indeed the cost is not likely to exceed 20,000 francs (or perhaps even 15,000 francs) and it possesses the advantage of being able to send and receive messages when long-wave stations are unable to communicate.



F. Motor Communications.

Until recently, it had always been thought that crossing the Sahara would never be practicable; rare indeed were the explorers who had traversed it in caravans. Successive Governors-General of Algeria realised how desirable it would be to establish contact with the countries to the south of the great desert, and numerous missions have explored the country, noting the oases, water supplies and most suitable tracks. Many of these explorers were killed by Tuaregs, or lost their way and perished. At last the Foureau Lamy Mission showed that Northern Africa could be connected up with the Sudan. Subsequently, with the pacific conquest of the Sahara populations,

more and more frequent, and finally regular and constant, communications were established between the Algero-Tunisian posts and those of French West and Equatorial Africa.

The Citroën expeditions in 1923 and 1924 are still fresh in our minds; it will be remembered how M. Citroën with his caterpillar cars crossed the Sahara several times, either from Constantine via Biskra, or from Oran via Colomb Bechar and Saoura, reaching the Niger and Lake Chad. The Renault Mission with six-wheeled cars also made the crossing. Some travellers, like Captain and Madame Delingette, after skirting the Congo, ended their journey at the Cape. Others proceeded along the East Coast of Africa and finally arrived in Madagascar. Haardt, Ardouin Dubreuil, General Lestienne and his sons, and Gradis are names known to all, and the cinema has shown to the public the various vicissitudes of these journeys across the Sahara and the black continent.

It must not be thought that these expeditions, or that made by Colonel Courtot from Tunis to Chad along the Tripoli frontier, are merely " stunts ". These journeys are comparatively easy; Counsellor of the Government of Algeria proceeded in a heavy motor-lorry, from Algiers to Timbuctoo, remained in Timbuctoo for a few days and returned to Algeria, all within a month.

Successful attempts have been made to cover part of the route with ordinary cars and tyres. In September 13th last, the newspapers announced that an officer for native affairs had crossed from Oran to Bourem and Timbuctoo, via Colomb Bechar and Adrar, in an ordinary 10-h.p. torpedo.

X. CONNECTIONS BETWEEN NORTH AND CENTRAL AFRICA.

In agreement with the Government of French West Africa, the Algerian Government has for several years been engaged in preparing tracks across the Sahara, choosing, of the three main routes followed by former motor caravans, that which seemed to be the easiest to cross, maintain and supervise. It passes from Algiers via Laghouat, Ghardâia, El Goleah, Insalah and the Hoggar; this is believed to be the route formerly followed by the Romans. In the Hoggar the routes divide, one going towards Chad and the other towards Bourem, Timbuctoo and the Senegal Coast.

The Citroën Company had prepared hotels and bordjs for supplies in view of a regular service across the Sahara; these preparations have been suspended for the present. But other companies have been established to maintain periodical services. The Laglese Company will carry the mail three times a week from Touggourt to Ourgla, while the Transatlantic Company will serve the Great Erg and the southern oases.

The *Catelan Company and the P.L.M.* are at present constructing bordj hotels, and are supplying depots and workshops for repairs with a view to establishing in 1927 a regular round service with departures every twenty days, along the Niger, passing along the Government route: Djelfa, Ghardaïa, the Hoggar, Timbuctoo and French West Africa.

Another company, the *Compagnie générale Transsaharienne* will, in October, start a regular service via Colomb Béchar, Saoura, Tessalit and Bourem to Timbuctoo. It has also organised routes and supplies and possesses a wireless station.

In two years' time the tracks will be completed and it will then be possible to travel by ordinary cars, for all along the route there will be shelters, depots for repairs, and petrol supplies. Travellers will be protected by air and wireless supervision.

When it is remembered that an officer or an official leaving East Africa to return to France on leave or at the end of his service takes about two or three months to reach his native country by the ordinary routes, and that he has to be replaced during his absence, it will be understood that even with the high cost per kilometer of motors crossing these desert areas it will be worth while to send back Europeans residing in the Sudan over the Sahara route. An agreement is being prepared for this purpose.

The Chambers of Commerce of Oran, Algiers and Constantine are making preparations for a tour to study economic conditions along the Niger; three motor caravans will leave on November 1st from the three main towns by different routes, meet at Insalah and then proceed to Bourem, thence, via the Niger and Kayes, to Dakar, where they will embark.

The Sahara has been conquered; the desert is no longer an obstacle. It is crossed as the sea is crossed, with the difference that, whereas nothing can be obtained from the sea during the voyage, in the Sahara may be found assistance, water, vegetation and resources. Air, Adrar of the Iforas are elevated plateaux; the Hoggar attains nearly 3,000 metres. There is rain, there is cold, there are woods, and Europeans can live there. These three mountain groups are stopping places which have been properly organised and which will make it possible to maintain communications between North Africa and the Sudan.

It is the intention of the French Colonial Governments to strengthen the ties which unite the French African possessions; if the traders and farmers of Algeria begin exploring Equatorial Africa, if they are enterprising and full of initiative and energy, in a few years the trade route will run through Northern Africa and the trans-Saharan railway will come into being.

Before this project is carried out, it will be necessary to consider the effect on public health that might result from bringing within the Mediterranean radius diseases of men and animals which have hitherto been confined to Central Africa and might easily spread from the Algerian ports to Europe.

XI. DOES ALGIERS SATISFACTORILY FULFIL THE CONDITIONS FOR AN INFORMATION CENTRE ?

We do not think it necessary to insist on the advantages which Algiers presents for the collection and transmission of information. The shipping and air lines connecting Algiers with France, the rest of Africa and the other European ports are adequate; in addition to the railways which serve North Africa, there is a regular organisation for penetration by motor-car into the heart of Africa which it would be difficult to find elsewhere. Submarine cables and telegraph lines allow of the rapid transmission of information, and the wireless system seems to be highly developed; as this new science progresses, this method will be easier to use.

The most serious objection which could have been raised against Algeria, namely, that it is out of the way and too cut off from the rest of the continent (because it is separated from the rest of Africa by the Sahara), is entirely met by the measures which have been taken during the last few years to connect French Northern African possessions with her Equatorial and Western colonies. The Sahara no longer exists; at least it no longer separates, but even forms a link. In a very few years French Africa, with its motor connections, will form one single territory.

At annual meetings the Governor-General of Algeria and the Residents-General of Tunis and Morocco have drawn up similar sets of administrative rules, prepared the way for closer mutual relations, and established health liaison which has already given good results. In 1926 at one of these meetings, French West Africa was represented for the first time; it will certainly be represented with greater regularity when communications become easier.

If the Governments consider that the Information Centre ought to deal solely with West Africa, we think that its headquarters should be established on the West African coast in a port possessing good communications with Europe, America and the other maritime towns of the Atlantic seaboard. Does Monrovia possess all these advantages ? We think that Dakar, as proposed by Portugal, certainly possesses greater facilities and better means for the object in view.

If, on the contrary, it is held that the new service should deal with the whole African continent and in the first instance with North and West Africa, the organisation must have its headquarters in Africa and not in a European town. In June last, the Health Committee definitely decided against the choice of a non-African town, and Geneva does not seem to offer such advantages as to lead the Committee to reverse its decision.

XII. ALGIERS AS A CENTRE OF INFORMATION FOR THE MEDITERRANEAN

Algiers is in constant communication with Europe, from which it is only one day's journey distant. On looking at the map, it will be seen that the Mediterranean is divided by Sicily into an eastern and a western portion. Algeria is practically in the centre of the latter, and on the route followed by vessels proceeding from Gibraltar to the Near East or the Suez Canal.

If the proposal suggested by the Rapporteur of the Health Section to the Assembly is adopted and a number of district bureaux are established to collect maritime health information, Algiers would suit the purpose admirably. A very favourite port of call, it receives from vessels information on important health matters in the countries from which they come, and provides them with information obtained elsewhere. The importance of Algiers and its situation would, under the same conditions as the Piræus in the Eastern Mediterranean, render this port a suitable district bureau. In actual practice, Algiers has already been this for a number of years. Thanks to its old-standing organisation and its situation between the two neighbouring Protectorates, it centralises the epidemiological information from Tunis, Morocco and Algeria and transmits this information to all the sanitary services of Northern Africa and to the countries which maintain relations with Algeria. The North African statistics which appear in the bulletin of the International Health Office of the League of Nations are based on the bulletins published in Algiers.

With the progress of Sahara penetration, very complete contact, from a health point of view, will certainly be established with West and Tropical Africa, even if no centre of information is set up in Algeria.

XIII. WHAT SORT OF INFORMATION SHOULD THE CENTRE AT ALGIERS COLLECT ?

At its June meeting, it seemed to be the desire of the Health Committee that the Algiers Bureau should differ from the Singapore Bureau in that, instead of merely collecting administrative information, it should become rather a centre of scientific information.

Certainly, as Professor Cantacuzène pointed out, Algeria and North Africa have made a considerable contribution to tropical pathology. The names of Dr. Ch. Nicolle, Dr. Sergent, Dr. Burnet, Dr. Remlinger and their pupils will always be remembered in connection with discoveries regarding *typhus and relapsing fever* (and their transmission by lice) *kala-azar in children*, the *Aleppo boil, intermittent fever, malaria, trachoma, bilharziosis*

he *sera* and *vaccines* of *scarlet fever, soft chancre,* etc. Research work, with practical results nto *sheep-pox, debab, piroplasmosis* and other diseases affecting domestic animals, has been arried out in North Africa, mainly by the Pasteur Institute of Algiers.

It would doubtless be extremely useful for all the heads of health services to receive, together with notification of one or more contagious cases, a summary, statement, or list of documents n the work done in different countries on one particular disease.

So many publications appear in foreign languages that it is impossible to keep in touch with all the literature on any given subject. An epidemiological bulletin containing, in the form f an annex, either bibliographical indications or a short summary of work and researches carried ut in connection with African diseases, might possibly be of considerable interest.

This is the rôle which the *Bulletin Sanitaire de l'Algérie* endeavours to fulfil in North Africa. n this Bulletin the epidemiological information is followed, for the use of practitioners, by accounts r summaries of the latest publications on the pathology of the country.

XIV. SUPPORT FROM AFRICA.

In order to meet the Committee's wishes, I have written to all the health administrations in frica with whom I am in relation. Unfortunately, during the summer months, nearly all the fficials, and particularly the governors and heads of services, are on leave in Europe. Under ese circumstances I have received only a few replies. I have, however, obtained the entire dherence of Morocco and Tunis, and a promise of help if necessary from Dr. Ch. Nicolle, whose uthority as a scientist is undisputed; M. Carde, Governor-General of West Africa, has also romised me his support.

There will certainly be further examples of this sign of good will. I base my hopes on a communication I have just received from Medical Inspector-General Lasnet, Director of the Health ervice of French West Africa. He informs me that the British, who, at Freetown, did not seem ery anxious to organise a bureau of health information (as stated above, the British Government firmed that it was not at present able to carry out such a suggestion), have now themselves come rward with a proposal to establish relations between the various States. " The Government of igeria has put forward a proposal which really amounts to a Convention for establishing coperation. The Director of the Biological Institute at Sierra Leone was sent to us for the same urpose, and the Gold Coast and Gambia have already begun to send us information."

These are the regional agreements provided for in the Health Convention, and they are being ncluded between the various States of West Africa. This decision will, I am sure, meet with your pproval. The situation is therefore very satisfactory; local and universal health protection can est be secured by health co-operation between these neighbouring countries, which are so milarly situated.

The agreements concluded in 1923 between the three French possessions of Africa Minor lgeria, Tunis and Morocco), which were extended in 1926 to French West Africa, do not in any ay run counter to the present proposal which is of a more general and far-reaching character.

XV. DRAFT ORGANISATION OF THE INFORMATION CENTRE AT ALGIERS.

As already stated, it has been impossible, during the last few " holiday " months, to obtain m the administrations working under summer conditions official replies or any documents rthy of publication. If an experiment in collecting information is to be carried out, it must be gun in the winter, and we shall have to be allowed several months to ascertain the results. In der to avoid expenditure which would be wasted if the Centre does not continue its work, we uld propose that no premises should be acquired or rented, and no office material purchased. e could house the Centre provisionally in our own offices. It would be sufficient to provide laries for the staff which would receive the information, classify it, and prepare the bulletins. he latter would, according to circumstances, be sent out by telegram or by post.

In my opinion, only information concerning *plague* and *yellow fever* should be sent by cable. might, perhaps, in certain cases, also be necessary to telegraph news on *relapsing fever* and *ebro-spinal meningitis,* or any other acute infection assuming serious proportions.

I would propose, as staff, a doctor acquainted with several languages, or, at any rate, with glish, and a stenographer.

Allowance would have to be made for certain office expenses and credits for postage and telems, printing or roneographing bulletins, preparing maps and graphs, and purchasing several rks on Africa, principally pathological works.

As I am not aware of the sums which could be granted us, and as I wish to reduce expenditure a minimum, at any rate during the trial period, it is very difficult for me at present to establish udget for the Centre. I would beg leave to discuss with the Health Section the details of the ganisation and administration of the proposed bureau in order that its work may be adapted the credits available.

Algiers, September 30th, 1926.

(Signed) RAYNAUD.

Appendix.

Draft Budget for the Organisation and Working of the Information Centre at Algiers.

I.	*Organisation*	Pro memoria
II.	*Working Expenses:*	French francs.
	Staff: One doctor	15,000
	Stenographer	12,000
	Additional assistance	5,000
	Office expenses	5,000
	Printing	10,000
	Postage and telegrams	18,000
	Various, unforeseen expenditure	5,000
	Total	70,000

At the present time this represents about 10,000 Swiss francs.

Annex to the Report on the Pan-African Epidemiological Centre.

General Survey of Infectious Diseases in Western and Tropical Africa in the Last Few Years.

Cerebro-spinal meningitis. — Originating in the Gold Coast in 1907, this disease subsequently made its appearance in the Sudan. In 1921, from British Nigeria, it had reached Niamey (French Niger). In 1924, again from Nigeria, it had reached Zinder (French Equatorial Africa), where it caused 4,000 deaths.

Since 1921, there have been over 25,000 deaths in West Africa.

Relapsing fever. — Isolated cases were reported in 1876, 1880 and 1906 along the Niger and the Basi.

In the French Sudan there were in one year (1921-22) 108,696 cases.

From the Sudan and the Upper Volta, it spread to the Niger. In 1924, of 1,100,000 inhabitants, 50 per cent had been affected and 100,000 deaths occurred.

The relapsing fever caused by lice which produced these epidemics might well be the relapsing fever caused by ticks and assimilated by lice.

The following is the number of cases which occurred in the other African countries from 1923 to 1925:

	Cases		Cases
Gold Coast	176	Northern Rhodesia	101
Nigeria	2,051	Tanganyika	320
Nyasaland	289	Egypt	4,325
Uganda	1,076		

Cholera. — This disease made its appearance in Morocco in 1866; it then passed south, causing havoc at Mogador. By the desert it reached the Wady Dra'a and Senegal in 1868, when there was a very serious outbreak.

A fresh and last epidemic occurred in 1893; St. Louis, Dakar and Rufisque were affected.

Plague. — Morocco was seriously affected before the war; in 1914 the plague came to Dakar, where 50 per cent of the population contracted the disease. All forms were observed, but particularly the septicæmic and pneumonic at the beginning. There was a very high death rate among rats. At Dakar, 1,423 inhabitants died.

		Deaths	
1919	Dakar	832	
1920	»	127	
1921	»	884	out of 1,180 cases (74 per cent case fatality).

As a result of the energetic measures taken, only isolated cases now occur, but Rufisque was affected in 1914 and St. Louis in 1917. Central Senegal was invaded in 1919 and the whole of Senegal in 1920, which in eleven years (1914-25) lost 31,753 inhabitants.

Throughout the whole of Africa, from 1922 to 1925 inclusive, the following cases have been recorded:

	Cases		Cases	
Algeria	38	Mauretania	11	
Angola	812	Nigeria	1,172	
Gold Coast	325	Nyasaland	11	
Egypt	2,521	Uganda	3,877	(3,636 deaths)
Canaries	79	Senegal	4,331	(2,641 deaths)
Cape Verde Islands	56	Italian Somaliland	82	
Mauritius	472	Tanganyika Territory	177	
Kenya	2,937	Tunis	62	
Madagascar	4,226	Union of South Africa	508	
French Morocco	221		21,918	in four years.

Yellow fever. — The first outbreak of which the history is known is that which occurred in 1779, destroying Gorea. Since then Senegal has experienced outbreaks about every ten years. In 1830, there was a fresh epidemic, which decimated Gorea and Dakar; at St. Louis 50 per cent of the Europeans died. The infection came from Sierra Leone. In 1837 it came from Bathurst and caused numerous victims; 23 per cent of the Europeans died. Again coming from Bathurst in 1859, yellow fever caused in Gorea 244 cases among the 267 Europeans. In 1866, it lasted for three months at Gorea; there were 83 deaths. In 1878, seven-eighths of the population of Gorea was destroyed; Dakar lost 50 per cent of its population. Of the Europeans there were 149 deaths out of a total of 1,474. The disease took an appallingly heavy toll of doctors and chemists, of whom 22 died.

1880, St. Louis, 80 deaths.

1882, Gorea, 15 deaths. Gorea was definitely abandoned as being too unhealthy; this was the beginning of the development of Dakar.

1900, Dakar attacked. Also Rufisque and St. Louis, 50 per cent deaths; Gorea, 20 deaths.

The Sudan was infected along the railway line from Kayes to Bamako (1891-93). Toukoto (1906), Grand Bassam (1901-03) sporadic cases.

Since 1922, isolated cases have been reported at Segon, Sikore (Niger), in Dahomey and in the Sudan.

From 1921 to 1925 the following cases have been reported in West Africa:

	Cases
Ivory Coast	10
Gold Coast	46
Dahomey	14
Liberia	4
Nigeria	25
Sudan	6
Togo	1
	106

Typhus. — Doubtless, owing to the fact that some of the black races wear no clothes, typhus is unknown throughout the greater part of Africa. It is only met with in the north (Algeria, Tunisia, Morocco, Egypt), where the inhabitants are Berbers, and in Basutoland and the Union of South Africa, where no doubt the blacks wear clothes.

These are the figures for the cases reported from 1920 to 1925:

	Cases
Algeria	11,352
Tunis	970
Egypt	25,161
Union of South Africa	34,570
Basutoland	2,416
	74,469

[This information has been collected from various sources, but is mainly drawn from a lecture delivered by Dr. Brau at Dakar (*Bulletin de la Société de Pathologie exotique*, 1926, No. 5).]

We should like to thank the Director-General of the Postal Service of Algiers, M. le Commandant LEMAITRE, Chief of the Geographical Service of the 19th Army Corps, and M. Flotte de ROQUEVAIRE, Director of the Algerian Topographical Service, who have been good enough to give us most valuable information and to prepare very detailed charts showing the lines of communication by wireless, by aeroplane and by motor-car in the north-west districts of Africa.

THE AUTHOR.

C. H. 509.

ANNEX 111.

PROPOSED ESTABLISHMENT OF A SANITARY EPIDEMIOLOGICAL BUREAU FOR WEST AFRICA.

REPLY FROM THE GOVERNMENT OF THE UNION OF SOUTH AFRICA.

Pretoria, September 7th, 1926.

I am directed by the Prime Minister to inform you that the question of the establishment of a Sanitary and Epidemiological Bureau on the West Coast of Africa was discussed at Freetown on May 17th, 1926, by members of the League of Nations Study Tour (West Africa), Sir Edward Thornton being present as the representative of the Health Department of the Union of South

Africa. It is considered that the establishment of a West African Bureau would involve the various Administrations in expenditure for which they would not get proper value and that the Bureau would not be of much, if any, use to South Africa.

In the circumstances, the Union Government does not see its way to contribute to the cost of the establishment of such a Bureau, but, if it should be decided to establish a Bureau in a suitable locality with the object of serving the whole continent of Africa, the Union Government would be willing to consider the question of making a fair contribution.

SOUTHERN RHODESIA.

The Medical Director understands that the Dominions Office of the Government of Great Britain have now heard from the High Commissioner for Southern Rhodesia in London that the Medical Director in Southern Rhodesia advises that the endemic and epidemic diseases of West Africa which the recent study tour has been specially requested to consider are not at present of outstanding importance in Southern Rhodesia and it is not considered that the colony is directly interested in the establishment of an Epidemiological Bureau in West Africa.

C. H. 509.

REPLY FROM THE BELGIAN GOVERNMENT.

[*Translation.*] Brussels, September 17th, 1926.

I have duly informed my colleague in the Colonial Department of the contents of your letter of July 23rd last relating, to the establishment of a Sanitary and Epidemiological Bureau on the West Coast of Africa.

M. Houtart writes that, after considering the reports of the doctors who took part in the interchange organised by the League of Nations on the West Coast of Africa, he considers that, since the Belgian Congo is pre-eminently a Central African colony with a small seaboard and very extensive frontiers, the Bureau should be Pan-African.

The Minister for the Colonies considers that the place selected for the establishment of the Bureau should possess full postal and telegraphic facilities and be conveniently situated as regards railway, air and maritime communications.

Following the advice of the Governor-General of the Belgian Congo, he proposes the selection of Geneva for the seat of the Sanitary and Epidemiological Pan-African Bureau; this Bureau should be set up at the headquarters of the Health Committee of the League of Nations, of which it would form a natural appendage.

Indeed, Geneva possesses all the requisite facilities from the point of view of international communications. Even should another place be selected, all or almost all the communications received at the Bureau or despatched from it would be communicated either by cable or otherwise to the Health Committee at Geneva. M. Houtart adds that it should not be forgotten that this Bureau would only be a centre of information and not a scientific centre. Two clerks would be sufficient for this transmission work; consequently, work would be simplified and an economy effected on staff.

For these various reasons, and until some other Central African town fulfils the conditions required for a Pan-African Sanitary and Epidemiological Bureau, my colleague at the Colonial Office considers that the selection of Geneva is preferable to any other.

In forwarding his reply to me, the Minister for the Colonies transmitted for your information the following details concerning telegraphic communications in the Belgian Congo (Appendix).

(Signed) The Director General,
For the Minister.

Appendix.

BELGIAN CONGO.

Telegraphic Lines.

The Belgian Congo is connected with the following adjoining territories:

(1) Banana - Cabinda;
(2) Matadi-Noki (Angola);
(3) Leopoldville - Brazzaville (French Equatorial Africa);
(4) Beni - Fort Portal (Uganda);
(5) Sakania - Broken Hill (Rhodesia);
(6) Albertville - Kigoma (Tanganyika Territory) by wireless.

It is connected with Europe by the cable of the Eastern Telegraph Company:

(1) From Banana to the St. Thomas - Loanda cable;
(2) From Elisabethville by wire to Cape Town, and thence by cable;
(3) From Albertville by wireless to Kigoma (Tanganyika Territory) and by wire to Dar-es-Salam;
(4) From Beni to Fort Portal and Mombasa by wire and thence by cable.

A wireless shore station connects Banana with ships at sea.

Wireless stations exist at Albertville, Banana, Basankusu, Basoko, Beni, Buta, Coquihatville, lizabethville, Ilebo Kikinga, Kindu, Kongolo, Leopoldville, Lusambo, Stanleyville, Chikapa, mangi, Usumbura, for internal communications.

The cost of telegrams for Algeria is 3.125 gold francs via Banana, and 3.22 gold francs via kania and Cape Town.

C. H. 509.

REPLY FROM THE SPANISH GOVERNMENT.

ranslation.]

Madrid, September 6th, 1926.

I have the honour to inform you that the Spanish Government agrees in principle to the ablishment, under the direction of the Health Committee, of an Epidemiological Bureau on the est Coast of Africa, similar to that already established at Singapore, for the use of nations having erests on this coast. The Spanish Government reserves the right to notify its final acceptance til it has received detailed information relating to the proposed organisation.

The Spanish Government considers that the most suitable seat for this Epidemiological Bureau uld be Monrovia. In the first place, the capital of Liberia is centrally situated on the Equatorial ast of Africa—, a situation which facilitates the centralisation of all medical intelligence which it l be the duty of the office to collect; and, further, Liberia is the only territory in this part of ica which is not a colony; it is therefore in a more favourable position than any other territory.

(Signed) Director of the Department
ad interim.

C. H. 509 (*a*).

REPLY FROM THE FRENCH GOVERNMENT.

anslation.]

Paris, October 4th, 1926.

In reply to your letter of September 15th, 1926, I have the honour to forward a copy (see pendix) of a letter addressed by the Minister for the Colonies (Inspector-General of the Health vice) to the Minister for Foreign Affairs concerning the establishment of a Sanitary Bureau the countries on the West Coast of Africa.

This letter explains reasons for the establishment of this Sanitary Bureau and for the selection Dakar as its seat.

The arguments put forward in this letter appear to me to have lost nothing of their force.

I. It is not desirable to delay the creation of a Bureau for West Africa.

It is now some time since the St. Paul de Loanda Congress drew attention to the permanent ace created by the health conditions in the countries of West Africa and the suspicions and the nsidered measures to which they frequently gave rise.

From that time, the *immediate* necessity has been apparent for establishing a Bureau for West ca for the purpose of centralising, co-ordinating and distributing health information, and for ng all steps likely to restore confidence, improve the public health and promote economic course by a closer co-operation between the experts in these matters.

II. The creation of a Pan-African Bureau to deal with African epidemiology as a whole would seem well adapted to fulfil the purpose in view.

The whole of East Africa bordering upon the Indian Ocean is rather within the sphere of the apore Bureau; North Africa (Algeria, Tunis, Morocco), bordering upon the Mediterranean, rally belongs to the Mediterranean epidemiological system.

The West Coast of Africa thus forms a special unit needing its own organisation, and the ral centre for this organisation is Dakar.

(Signed) AUDIBERT,
The Inspector-General
of the Colonial Health Service.

Appendix.

e Minister for the Colonies to the Minister for Foreign Affairs Department of Political and Commercial Affairs, French League of Nations Department.

nslation.]

Paris, January 19th, 1926.

I have the honour to acknowledge receipt of your letter No. 13 dated January 7th, 1926, rning the proposed establishment of a Sanitary Bureau for the countries on the West Coast rica.

I agree entirely with the suggestions made by the Secretary-General of the League of Nations.

I will request M. Carde, the Governor-General, in consultation with his technical adviser, the Inspector-General of Medical Services, Dr. Lasnet, to study the proposals of the Health Committee of the League of Nations and to submit his preliminary conclusions to the Conference to be held on the termination of the interchange of health officers.

* * *

I have consulted my technical advisers, and I consider, in the first place, that the establishment of a Sanitary Bureau for countries situated on the West Coast of Africa would be of great value.

In Africa, there exist permanent centres where serious endemo-epidemic diseases are more or less latent and liable to break out at any time. This constant threat is a great obstacle to intercourse both on land and sea between adjoining countries. It puts all the countries of West Africa from Morocco to Angola in a perpetual state of alarm and mutual suspicion, and, since the International Sanitary Convention of January 17th, 1912, does not appear to them to contain sufficient safeguards they take measures which are often excessive or unjustified and which are a great hindrance to their commercial relations and their economic development.

For these reasons, it would seem of advantage to establish a Sanitary Bureau suitably placed for the centralisation of information, the duties of which would be:

1. To collect, in the quickest way, accurate health intelligence concerning endemo-epidemic diseases liable to be transmitted from one country to another by land or sea; to co-ordinate this information and forward it to the other sanitary administrations concerned.
2. To strengthen the bonds of solidarity in health matters and open up the way for real co-operation between adjoining countries by urging them to enter into special agreements suitable to their geographical situation, needs and organisation.
3. To develop the relations between health authorities by organising interchanges and promoting meetings for the discussion of health problems relating to the countries of Africa and requiring general preventive measures.

If the League of Nations accepts the principle of the establishment of a Sanitary Bureau for the countries on the West Coast of Africa, I consider that Dakar would be, without any question, the most suitable place for such a Bureau.

This choice would be justified by the extent and importance of the French possessions in Africa and the fact that seven French colonies, stretching from Senegal to Nigeria and Chad are, so far as health matters are concerned, under the single authority of the Inspector-General of Health Services of French West Africa, who also exercises a certain supervision over the four colonies of French Equatorial Africa from Gaboon to Chad.

Moreover, Dakar enjoys an exceptional geographical situation and possesses, for relations of all kinds, advantages which will not be found to the same extent in any other place; it is connected directly by submarine cable with Europe, both North and South America and the whole African coast; it possesses a powerful wireless station; its system of land telegraphs, supplementing the coastal cable and acting as a substitute for this in case of interruptions, puts it in communication with all the capitals of the French and foreign colonies from Nigeria to Chad; its port is normally served by a large number of French and foreign steamboat lines, and lines which do not use this port pass within sight of Cape Verde; it is therefore most easy, in cases of emergency, to communicate by wireless with a steamer which could call at Dakar without entailing any serious deviation from its course.

Communication, by rail as far as Kulikoro and thence by motor, can be maintained during eight months of the year with any place in the French or foreign possessions from the Ivory Coast to the Shari. Further, the air services at Dakar and Bamako, which are gradually being developed would supply a rapid means of transport for the members of the Bureau, if not to every place, at least to many points near to places where they would have to conduct their investigations.

Should Dakar be finally selected, there is no doubt that the Governor-General of French West Africa, who has always given the greatest attention to health questions, would endeavour in every way to assist the establishment of this Bureau and to keep down the expenditure entailed by it for the League of Nations.

Moreover, there is no doubt that he would give every facility to this Bureau to use as correspondents the medical stations in Central Africa, such as Niamey (a place which must be passed on all roads leading to the East) or Zinder (an important watering-station on the roads leading from the north towards Kano), which are therefore placed for this purpose in an exceptionally favourable position for supervising migration and the movements of all caravans in districts likely to spread epidemic meningitis or relapsing fever.

(Signed) PERRIER.

C. H. 50

REPLIES FROM THE BRITISH GOVERNMENT.

I.

London, July 17th, 1926.

With reference to the letter from the Foreign Office of February 1st, I am directed by Secretary Sir Austen Chamberlain to inform you that the Governments of the British colonies

Vest Africa have considered the proposal for the establishment of a Sanitary and Epidemiological Bureau on the West Coast of Africa and that they have reached the conclusion that they are unable o support the scheme.

II.

London, September 2nd, 1926.

With reference to the letter from this department of July 17th, I am directed by Secretary ir Austen Chamberlain to state that it may be of interest to the Health Committee of the League o know that the Governments of the British West African Colonies based their decision not to ıpport the proposal to establish a Sanitary and Epidemiological Bureau on the West Coast of frica on three grounds: (1) that the existing arrangements for the interchange of information on ealth matters were sufficient; (2) that the expense involved would not be justified by the results; nd (3) that, if the present direct method of notification were abandoned and all notifications sent ıly to the Bureau for distribution, unnecessary delay would be caused.

C. H. 509.

Reply from the Portuguese Government.

Translation.]

Lisbon, September 13th, 1926.

I have the honour to inform you that the Portuguese Government agrees, in principle, to the tablishment of this Sanitary and Epidemiological Bureau, in view of the gravity and the pre-lence of endemic and epidemic diseases in the countries on the West Coast of Africa and the nger arising therefrom. In the opinion of our Colonial Administrations, this Bureau should of the greatest value in the preventive campaign against these diseases which are generally evalent on this coast; by instituting an enquiry, leading ultimately to the adoption of hygienic d prophylactic measures to combat the spread of these diseases, it would do much to promote e welfare of these people. The efficacy of the measures taken will be increased by closer sanitary -operation between the different territories and by the more or less prompt interchange of sta-tics and information concerning sanitary conditions in the different districts.

There is therefore every advantage in establishing this Epidemiological Information Bureau— ıose duties would be similar to those of the Far East Health Bureau — in a place having good egraphic communications. In the opinion of the Portuguese Government, Dakar might be ected as fulfilling the above-mentioned conditions.

As to participation in the working expenses and representation on the Bureau, Portugal erves its decision until the proposal for the establishment of the Bureau has been approved by League of Nations.

(Signed) Antonio da Costa Cabral,
Head of the Secretariat.

ANNEX 112.

C. H. 505.

INTERIM REPORT ON THE WORK OF THE SLEEPING-SICKNESS COMMISSION.

It will be recalled that at the International Conference held in London in May 1925 it was ided that the Commission should present a special report to the League of Nations Expert nmittee on the expiry of twelve months from the beginning of its work. As it would then be late to take any decision as to the continuation of the work of the Commission, should such ɔurse prove desirable, it is necessary at the present time to take stock of the situation, though s not possible at this stage to estimate with any approach to certainty the progress that will e been made by the Commission at the end of its first year's work. Moreover, it is hardly missible to forecast the results of experimental investigations actually being carried out.

The four main questions referred to the Commission were concerned with:

1. The existence of human immunity against trypanosomiasis, the nature of such immunity and the factors which determine it.
2. The function of wild and domestic animals as breeding grounds for the virus.
3. Relations between *Trypanosomiasis gambiensis* and *Trypanosomiasis rhodesiensis*.
4. The testing of the blood in the alimentary canal of the tsetse fly by the precipitin reaction.

Practically all the work which the Commission is undertaking is directly concerned with one ɔther of these problems, though several interesting and promising side-lines are also being ɔwed.

The study of human immunity to trypanosomes is obviously impossible by direct experiment and has to be undertaken by epidemiological investigation of a most comprehensive kind in infected areas. Such epidemiological studies have been entrusted to Dr. Van Hoof (the Belgian member of the Commission) and Dr. Kleine (the German member), the former of whom has been working hitherto in Budama, Uganda, the latter in Kavirondo. Both these are gambiense-infected areas. In these epidemiological enquiries the existence of other than human hosts of the virus is also being studied.

Dr. Kleine is now leaving for Musoma in the Mwanga rhodesiense-infected area, and Dr. Van Hoof is at headquarters, preparatory to departure for the Semiliki infected area in the Congo.

Dr. Duke expresses himself as well satisfied with the progress made in these epidemiological enquiries and he states that it is highly desirable that Dr. Van Hoof should continue such studies in association with his present colleagues until several different areas have been examined where the disease can be studied in its endemic and epidemic forms. At the laboratory at Entebbe, a careful morphological study is being made of the strains of trypanosomes sent in from the field. Very interesting results are expected from this part of the enquiry.

The scope and limitations of the precipitin test in determining the food supply of wild tsetse has been found difficult and complicated. The digestion of blood is rapid and it is hard to obtain a specific reaction with the products of digestion as commonly found in wild tsetse. The enquiry is still progressing, however.

Hitherto, chief attention has been given to *T. gambiensis*, though Dr. Lavier (the French member of the Commission) has been studying the morphology of a strain of *T. rhodesiensis* obtained from the Mwanga area. As stated above, *T. rhodesiensis* is about to be studied by Dr. Kleine and by the rest of the Commission at a later date as suitable occasion arises. The knowledge now being acquired from the concentrated study of *T. gambiensis* will be of the greatest assistance when special attention is directed to *T. rhodesiensis*.

In connection with the epidemiological studies being carried out by Dr. Van Hoof and Dr. Kleine, a certain amount of interesting therapeutic work is also being done.

With regard to the laboratory studies now being undertaken, special reference may be made to:

1. A comparative morphological study of human trypanosomes, with special reference to the determination of the resistant and transmissible forms of the parasite;
2. Attempts to infect baboons by reducing their resistance by chemical and biological agents.

These enquiries have been entrusted to Dr. Lavier.

3. The preparation of precipitin sera, using as antigen:

   (*a*) Fresh blood,
   (*b*) Products of digestion of blood obtained from the fly's intestine.

This work is being done by Dr. Prates (the Portuguese member of the Commission).

4. Transmission experiments; effects of direct transmission: transmission of arsenic-fast strains; transmission of human strains and the investigation of " infectivity " of natives suffering from trypanosomiasis; the effect of Bayer 205 on tsetse trypanosomes.

This latter work is being carried out by Dr. Duke himself, with the assistance of Dr. Prates.

From the above short summary, it will be appreciated that the four large questions referred to the Commission have necessitated a great number of important enquiries. Dr. Duke expresses the opinion that a period of eighteen months or, in other words, an extension of the present twelve months' enquiry for a further period of six months, will enable definite conclusions to be drawn about many of the points set forth in the Commission's detailed programme of work.

ANNEX 113.

C.H.516.

WORK OF THE INTERNATIONAL COMMISSION ON SLEEPING-SICKNESS.

LETTER FROM THE FRENCH MINISTER FOR FOREIGN AFFAIRS TO THE SECRETARY-GENERAL.

[*Translation.*]

Paris, October 8th, 1926.

In reply to your letter of September 13th last concerning the International Commission on Sleeping-Sickness, I have the honour to inform you that the French Government sees every advantage in the proposal to prolong the work of this Commission.

The important enquiries undertaken and its future conclusions will certainly suggest to the Ministry for the Colonies effective methods to be applied in the campaign against sleeping-sickness in the Cameroons and in French Equatorial Africa.

ANNEX 114.

C. H. 503.

NOTE ON THE WORK OF THE SMALLPOX AND VACCINATION COMMISSION.

I. It will be remembered that the Smallpox and Vaccination Commission, at its meeting at The Hague in January 1926, recommended that the attention of public health administrations should be drawn to the occurrence in certain countries of cases of post-vaccinal encephalitis, and that they should be requested to furnish the Health Section with detailed reports of any similar cases observed in the future.

The following replies have so far (September 15th) been received to the circular letter which was accordingly sent out:

The health administration of *Albania* stated that, although 45,000 vaccinations had been performed during 1925, no case of encephalitis had been observed, but that the investigation would be continued throughout the year.

The public health administrations of *Australia, Bulgaria, Czechoslovakia* and *Greece* stated that an enquiry would be undertaken, the results of which would be communicated in due course.

The health administration of *Costa Rica* stated that no case of post-vaccinal encephalitis had occurred. The single case of encephalitis observed in 1925 had been unconnected with vaccination.

The *Canadian* Department of Health stated that no connection had been observed between vaccination and encephalitis.

The health service of *Luxemburg* stated that no case of the kind had been observed.

The *New Zealand* Department of Health stated that no case of post-vaccinal encephalitis had come to light. During recent months, however, a case of encephalitis had followed on chicken-pox, the disease developing during the third week of the attack.

The health administration of *Panama* stated that, although a large number of vaccinations had been carried out, no case of post-vaccinal encephalitis had been observed, but that the physicians concerned had been informed.

The Director of Public Health of *Peru* stated that the institutes concerned had been informed and that their replies would be transmitted at a later date.

The health administration of *Siam* stated that no case of post-vaccinal encephalitis had occurred; an enquiry had been started, however, the results of which would be communicated in due course.

The health administration of *Venezuela* stated that no case of encephalitis had been observed, either connected or unconnected with vaccination.

II. It was further decided that a study should be made of the methods employed in Government institutes and others under Government control in the preparation, examination, distribution and employment of vaccine lymph; a questionnaire was accordingly drawn up by the Conference, a copy of which was forwarded to all public health administrations.

Answers to this questionnaire have now (September 15th) been received from:

Australia
Bulgaria
Canada
Czechoslovakia
Esthonia
Great Britain
Hungary
Irish Free State
Luxemburg
Siam.

The methods applied by the lymph establishments of these countries in the vaccination of animals, preparation, collection and distribution of lymph are in general conformity. A detailed report on these methods, as well as on potency and bacteriological tests used in the different countries, will be presented in due course.

III. Finally, it was decided to undertake a comparative investigation of various laboratory methods at present in use to estimate the potency of vaccine lymph. The methods to be compared in the various institutes of England, France, Germany and Switzerland are those of Calmette and Guérin, Gins, Groth and Sobernheim. The investigators have been supplied with samples of strains prepared by Dr. Guérin and Dr. Blaxall and by Professor Gins and Professor Sobernheim. The results obtained by the use of these methods have now been reported upon by Professor Gins, Dr. Guérin and Professor Sobernheim; a comprehensive report will be issued shortly.

C. H. 507 (1).

ANNEX 115.

REPORT ON THE CONFERENCE OF HEALTH EXPERTS ON INFANT WELFARE,

HELD AT GENEVA ON SEPTEMBER 27TH, 28TH AND 29TH, 1926, AS APPROVED BY THE HEALTH COMMITTEE OF THE LEAGUE OF NATIONS ON OCTOBER 18TH, 1926.

During its sixth session, the Health Committee adopted a resolution of which the following is an extract:

> " The Health Committee . . . decides . . . to empower the Medical Director to invite a limited number of experts or public health administrations to suggest, after study of the question, the directions which the Health Organisation of the League could most usefully follow in making international enquiries, in conformity with the resolution adopted by the sixth ordinary session of the Assembly. "

Accordingly, a Conference of Child Welfare Health Experts met at Geneva on September 27th, 28th and 29th. The following agenda was adopted:

1. Possibilities of a comparative enquiry into infant mortality in different regions of Europe (or other parts of the world) with high and low infant mortality rates — with special reference to the underlying causes, such as social and hygienic conditions, housing, nutrition and child welfare activity.
2. Possibilities of an enquiry into the incidence of rickets, anæmia, tetany and scurvy in children up to two years of age in different countries, with special regard to the nutrition problem.
3. Unification of the registration of infant deaths.
4. The possibility of facilitating climatic treatment for children of foreign countries Measures required in the interest of the children and of the country which receives them.
5. Instruction in infant welfare of medical students and other persons concerned.
6. The value of preventive immunisation against infectious diseases of children (diphtheria, scarlet fever, measles, chickenpox, whooping-cough and tuberculosis).

The Conference was able to reach agreement and to adopt recommendations on all the subjects presented for its consideration and its views are expressed in a series of resolutions which accompany this report.

1. — The Conference considered the advisability of recommending to the Health Committee a study of preventive immunisation against diphtheria, scarlet fever, measles, chickenpox, whooping-cough and tuberculosis. After detailed discussion, it was decided that the protection of children against diphtheria, scarlet fever and measles by preventive immunisation could not be studied as a whole but should be separately considered. In view of the value of the results obtained by the use of active immunisation against diphtheria in certain countries and the fact that such immunisation had been practised on a large scale, it was decided to recommend that a report on this subject should be secured and a study be made of the procedure adopted in those countries where a large amount of work had been carried on. The Conference was of the opinion that from the results of such a study it might be possible to draw conclusions as to the general practicability of this method of prevention.

2. — The Conference recommended a similar study in the case of immunisation against measles and considered that account should be taken of the experience of those countries where successfu results had been obtained as well as of those countries in which difficulties had been encountered.

3. — The results of immunisation against scarlet fever should be studied, the Conference thought, in the United States of America and certain European countries where experience on a large scale had been acquired. The Conference also pointed to the utility of including in the scope of the study a detailed description of the methods employed and of the opinions formed as to its value.

The Conference did not consider it opportune to recommend a study of immunisation against chickenpox or tuberculosis. In the case of tuberculosis, it was thought that this subject was not ripe for study by this group.

In so far as whooping-cough is concerned, consideration was given to the work in Denmark where the prevention of this disease had been studied for some years, and it was thought that the President of the Health Committee might wish to describe this work to the members of the Health Committee.

4. — The Conference regarded the knowledge of the practice in different countries with regard to the instruction in child hygiene given to medical students, midwives and public health nurses as a necessary element for the preparation of its general report to the Health Committee and therefore it recommended that its members be invited to prepare reports on this subject for their respective countries.

5. — The Conference examined with great interest the proposals made by Professors Gini and Rott in regard to the unification of registration of infant deaths and also a proposal by

Professor Rott that a further effort be made to secure the universal adoption of the definition of " dead birth " as already recommended by the Health Committee to the various Governments. The Conference decided to draw the particular attention of the Committee to the importance of the proposals made by Professors Rott and Gini and to suggest that the Health Committee might wish to refer these proposals to its expert statistical committee at an early date for study and advice.

6. — The Conference recognised that the possibilities of a comparative enquiry into infant mortality in different regions of Europe, etc., was one of the most important matters submitted for its consideration. It is a question which intimately affects all countries, in most of which much research and investigation have already taken place. Extensive statistical enquiries have been and are now being made, and therefore, instead of proposing further similar investigations, it considered that a medical and clinical enquiry would have greater immediate practical value.

It was agreed that, in the countries represented at the Conference, areas should be selected which would include two urban and two rural districts, one of these in each case having high and the other low infant mortality rates. In view of the high death rate during the first week of life, it was suggested that, although the enquiry would cover a period of one year, special attention should be paid to mortality during this period. Further, although the general lines of such an enquiry can be laid down at a Conference, it is impossible to decide upon all details necessary to secure uniformity of method without some practical experience of their value and suitability. Therefore, it was agreed that there should be a preliminary investigation during a period of three months, the results of which would enable the Conference to make definite recommendations as to the precise methods to be employed.

The general conditions which are suggested for the preliminary enquiry are as follows:

(I) The investigation should refer to the year 1924, but statistics for the period 1921 to 1925 may be utilised for the purpose of selecting suitable areas.

(II) The age of the children should be 0—1 year, the subdivisions being:

0 — 1 week,
1 week — 1 month,
1 month — 12 months.

(III) The enquiry should consider only the most important causes of infant mortality, namely:

Premature birth,
Injury during birth and congenital defect,
Deaths ascribed to debility,
Respiratory diseases,
Enteric diseases,
Infectious diseases (including tuberculosis and syphilis).

(IV) The enquiry should relate to the pathological, social and hygienic factors which influence infant mortality.

(V) The enquiry should take equal cognisance of official mortality statistics and of the actual experience gained by general practitioners, hospitals and public and private health agencies.

(VI) The data collected may usefully be supplemented by any conclusions which may be of practical importance and thus of value in subsequent enquiry.

As a result of the information gained through an enquiry relating to the year 1924, the Conference believes that it would be of great interest to arrange for a current study of infant mortality, conducted on similar lines, commencing on January 1st, 1927, and giving the results of one year's study.

7. — In view of the fact that in certain countries it might be difficult to select the areas for study, on the basis of data at present available, the Conference recommended that in such countries a general preliminary investigation, statistical in nature and relating to the whole country, might be advisable.

8. — With regard to the possibility of undertaking a comparative study into the prevalence of rickets, tetany and scurvy among children in different countries, the Conference does not feel justified in advising the Health Committee to undertake a special international investigation, but it considers that the Health Organisation of the League of Nations would be rendering a most useful service if it could take steps to establish relationship between certain important investigations now being carried on in different countries, notably with regard to the causation and prevention of rickets, and certain problems of nutrition.

9. — From the information before the Conference it appears that the question of affording facilities for the sojourn of foreign children in health resorts of various countries, where climatic and other conditions are more favourable than those enjoyed in the country of origin, is one that interests a certain number of European countries. The Conference had no specific recommendations to make regarding this matter, but should any health administration ask for the advice and

co-operation of the Health Committee in making the necessary arrangements, the Conference is prepared to act in an advisory capacity. In making this offer, it is influenced by the facts that medical indications call for careful consideration and that certain of its members have a practical experience of this matter.

10. — In discussing the general programme of its work, the Conference came to the conclusion that, should its recommendations be adopted by the Health Committee, special investigations would be necessary and an international interchange of documentation and information on the subjects studied might be of great value, and therefore suggests that the Health Committee might reserve some of the credits at its disposal for individual missions, study tours and any studies which it would be desirable to undertake in order to give effect to the recommendations of the Conference.

11. — Finally, in submitting the following resolutions for the consideration of the Health Committee, the members of the Conference desire to state that, in their view, the problems relating to infant mortality and to immunisation are of special importance at the present time, and for this reason they have suggested that any action which may be taken as a result of their recommendations should be directed in the first place to further investigations of these questions.

Resolutions.

I.

The Conference:

In view of the successful results of active immunisation against diphtheria reported from several countries, recommends to the Health Committee that a study be made of the methods adopted and the results obtained in those countries which already possess considerable experience of such immunisation; and believes that this study would enable practical conclusions to be drawn regarding the conditions of the applicability of this method.

II.

The Conference:

Recommends that a similar study be made of the work that has already been done in several countries with regard to immunisation against measles, paying attention to the experiences of those countries in which favourable results have been obtained as well as of those in which difficulties in practical application have been encountered.

III.

The Conference:

Considers that, with regard to active immunisation against scarlet fever, it would be of great interest to collect information concerning the results obtained in the United States of America and in certain European countries where the method has recently been employed on a large scale, with a detailed description of the method employed and the opinions formed as to its value.

IV.

The Conference:

Suggests that, in the event of its recommendations being adopted by the Health Committee, credits may be reserved in the budget of the Health Organisation of the League for individual missions, study tours and any investigations which may be necessary for the preparation of the reports.

V.

The Conference:

Considers that the instruction in child hygiene given to medical students, nurses, midwives and public health nurses is of extreme importance in regard to measures for the promotion of health and the prevention of disease among children. It regards a knowledge of the practice in different countries with regard to this matter as a necessary element for the preparation of its general report to the Health Committee and recommends that, as a first step, the members of the Conference be invited to present reports within six months on the teaching given in their respective countries.

VI.

The Conference:

Having considered the information placed before it by its members, and the resolution of the Health Committee dealing with the comparative enquiry into infant mortality rates, is of opinion that, in view of the large amount of literature existing in different countries, it is necessary to restrict the scope of the enquiry to certain well-defined problems which can best be elucidated by international study;

Recommends that members of the Conference be invited to prepare memoranda based on studies to be carried out in their own countries. It is suggested that these investigations should comprise the study of infant mortality in selected areas having high and low rates of infant mortality respectively but in which other factors, notably the birth rate, are relatively comparable.

If possible, both urban and rural areas should be considered.

It is understood that the enquiry will not relate so much to matters of pure statistics as to medical and public health questions studied with such expert statistical aid as may on occasion be required.

It is hoped that the results of this preliminary enquiry will be available at the end of three months, when the investigators will be in a position to make further and more detailed proposals based on the comparison of their results.

In view of the fact that in certain countries it might be difficult to select the areas for study, on the basis of data at present available, the Conference recommends that in such countries a general preliminary investigation, statistical in nature and relating to the whole country, might be advisable.

VII.

The Conference:

Having considered the unification of registration of infant deaths, recommends to the Health Committee that a further effort be made to secure the universal adoption of its definition of "dead birth" and that the proposals of Professor Gini and Professor Rott be referred at an early date to the Health Committee's expert statistical committee for study and advice.

Dame Janet CAMPBELL (Great Britain).
Dr. Taliaferro CLARK (U. S. A.).
Professor A. COLLETT (Norway).
Professor R. DEBRÉ (France).
Professor C. GINI (Italy).
Professor E. GORTER (Netherlands).
Professor C. PIRQUET (Austria).
Professor F. ROTT (Germany).

C.H. 517.

ANNEX 116.

REPORT OF THE PERMANENT STANDARDS COMMISSION

(Geneva, October 11th-13th, 1926.)

1. **Anti-Diphtheritic Serum.** — Dr. Madsen pointed out that, in accordance with the esolution adopted at the Paris Conference of 1922, he had carried out tests with standard sera rom London, Frankfort, Copenhagen and Washington, the last tests being made in September 926, and had found these standard sera to be identical in titre.

2. **Anti-Tetanic Serum.** — A proposal was presented to the Commission by the Conference f Laboratories, which have participated since 1922 in the studies carried on to establish an interational unit of anti-tetanic serum. On the recommendation of the Conference it was decided o define the new international unit as follows:

"The unit is to be determined with a standard serum in such a way that its relation to the American unit is exactly 2 international to 1 American unit.

"This resolution is the consequence of the proposals made to the Second International Serological Conference of 1922 by Professors Louis Martin and W. Kolle, and of the investigations carried out in the several laboratories since that date."

Dr. McCoy, Director of the Hygienic Laboratory at Washington, declared he had no authority o approve the new unit for the United States of America, but he could see no objection to American roducers of anti-tetanic serum for export indicating on the labels the content of serum in terms f the new unit, as well as of the American unit.

The different institutes represented at the Conference will establish a standard conforming o the definition of the new international unit. In order to ensure that the sera used as standards y the different States have identical titre, the State Serum Institute of Denmark, which or this purpose acts as a central laboratory for the Health Committee of the League of Nations, will arrange for comparative studies of such sera to be carried out every year and will eceive periodically samples of sera in order to carry out experimentally comparisons with such

sera. The Commission took note of the fact that the Institute of Experimental Therapy of Frankfort-on-Main, after having prepared a standard serum, will continue to furnish this serum to all Institutes which make the request.

3. **Anti-Dysenteric Serum.** — The conference of Directors of Institutes who have participated in the study of anti-dysenteric serum, namely Professors Louis MARTIN, T. MADSEN, KOLLE, HIRSZFELD, DOERR and Doctors TSURUMI, O'BRIEN, DUMAS and DOUGLAS, made a proposal with regard to the continuation of the experiments which had been undertaken as a result of the work of the Committee for the study of anti-dysenteric serum. The Commission adopted the resolution, which was presented in the following terms:

> " The method of assay for anti-dysenteric serum proposed by the State Serum Institute at Copenhagen, on the basis of the work carried out by the Committee for Investigation of Anti-Dysenteric Serum (President, Professor Shiga), constitutes a real advance on former methods.
>
> " It is desirable to continue the trials by taking as standard the serum of the Copenhagen Institute. The Copenhagen Institute will send to each laboratory, every two months for a year, the standard serum, with an exact indication of the method of using this provisional unit.
>
> " The laboratories concerned will send, every two months for a year, to Copenhagen, anti-dysenteric serum exactly assayed according to this method, with a view to confirmation of the results obtained.
>
> " If all the results are in agreement, it will be possible to adopt a definitive international unit, in terms of the standard serum of Copenhagen. Only then will it be possible to make a clinical investigation of the therapeutic potency of sera of different origins."

The Commission decided to outline for all the Institutes participating in this study a definite technique for the use of the provisional unit which was adopted and for the studies which will be continued during the year 1927 (see Appendix 1).

4. Anti-Meningococcie Serum. — The Commission is not in a position to recommend new studies on the standardisation of anti-meningococcus serum, since no new fact has come to light since the last International Serological Conferenie of 1922, which decided that none of the methods then in use could be recognised by all the experts as being certain enough to be utilised for the purpose of establishing a precise measure of the anti-body content or of the therapeutic value.

The identification of anti-meningococcic sera may be carried out by the determination of their content of specific anti-bodies by the method of complement-fixation or by the method of agglutination.

5. Anti-Pneumococcic Serum. — The problem of the standardisation of anti-pneumococcic serum has not yet reached a stage which permits the adoption of recommendations from the international point of view. The Commission does not desire to propose new studies, since no new observations have been added to those which are included in the report of the Second International Serological Conference held in 1922.

6. Scarlet Fever. — The Commission, after a discussion on the new specific methods for the diagnosis, treatment and immunisation of scarlet fever, and recognising, on the one hand, the importance of the problem and, on the other, the difficulty entailed in an attempt to make definite recommendations at the present time, decided to entrust to the American, British and Polish Institutes, in collaboration with the Copenhagen Institute, the study of these methods and requests its members to present a report at a subsequent session.

7. Tuberculin. — The Commission, having heard the communication of Dr. Tsurumi concerning the work of Professor Calmette, decides to initiate a comparison between the existing standards (Frankfort, Japan, Paris) for human and bovine tuberculin.

8. Dr. Madsen commented briefly on the present investigations of the tests for syphilis and on the work of the Smallpox and Vaccination Commission with regard to the standardisation of vaccine lymph.

9. Dr. Dale presented a short note on the progress made in the international standardisation of therapeutic substances by biological methods (Appendix 2).

10. Professor Kolle extended an invitation to the Commission to hold its next session at Frankfort.

Members present:

Permanent Standardisation Commission.

Professor MADSEN (President).
» DALE.
» KOLLE.
» Louis MARTIN.
Dr. McCOY.

Tetanus Conference.

Professor Louis MARTIN.
» KOLLE.
» MADSEN.
Dr. MCCOY.
» TSURUMI.

Dysentery Conference.

Professor KOLLE.
» DOERR.
Dr. DOUGLAS.
» DUMAS.
Professor HIRSZFELD.
» Louis MARTIN.
» MADSEN.
Dr. O'BRIEN.
» TSURUMI.

Appendix 1.

The participating institutes will receive an ampoule containing 1 per cent solution of the lysentery standard serum (Copenhagen) in glycerinated saline (two-thirds glycerin, one-third ormal saline), and one ampoule of standard toxin.

Of this toxin, an emulsion is made as follows:

The requisite amount of toxin is weighed out and added to the proper quantity of saline, ome glass beads are poured in, and the bottle vigorously shaken until a homogeneous suspension s formed with no visible particles. After 45 minutes at 37° C. the emulsion is shaken again nd, if necessary, may be kept in the ice-box until the following day. Before the testing, the haking is repeated.

After the toxin ampoule has been once opened, it should be kept in a desiccator with phos-horic acid anhydrid.

After the mixtures of serum and toxin are made, the small tubes containing them are well naken, kept for 45 minutes at 37° C. and again shaken before injection.

Doses of 0.5 c.c. each are injected into the tail veins of mice (15 to 20 gr.). The animals re to be kept under observation for seven days. Mice dying within 18 hours should not be included n the results but should be indicated in the report.

Example:

Ten doses of the toxin-antitoxin mixture (5 c.c.) is made.
Test dose of toxin: 0.33 mg.

(1) An emulsion of the test toxin is made so that 0.33 mg. is contained in 0.1 c.c.

(2)

	1 dose	10 doses
Serum	0.02 c.c.	0.2 c.c.
Toxin	0.1 c.c.	1 c.c.
Salin		3.8 c.c.
		5 c.c.

Of this, 0.5 c.c. is injected intravenously.

Six mice shall be used on each occasion that the serum is tested. The results may be recorded in tables similar to the sample attached.

SERUM Date of Titration.

Toxin :

Injection Volume 0.5 c.c.

Serum dosis	Number of living	Number of dead	Per cent living	Date of death							
				S <18T	1st day	2nd day	3rd day	4th day	5th day	6th day	7th day

Dosis neutralisata.
„ non-neutralisata.

Appendix 2.

NOTE TO THE PERMANENT STANDARDS COMMISSION ON PROGRESS MADE WITH THE INTERNATIONAL STANDARDISATION OF THERAPEUTIC SUBSTANCES BY BIOLOGICAL METHODS, PRESENTED BY DR. DALE.

Since the issue of the report of the Conference which met at Geneva in September 1925, progress has been made in the following directions.

1. *Insulin.*

The international standard, adopted by the Conference, has been distributed to the appropriate authorities in a large number of different countries, and its use now may be said to be world-wide, so that a unit of insulin has everywhere the same meaning. An account of the method of preparing the standard, of the international tests on the basis of which its unit value was settled, and the methods in use for determining the value of insulin preparations by comparison with the standard, has been published by the Health Organisation.

2. *Pituitary Substance.*

It was anticipated that no central supply of the standard substance would be required, since trials had shown that different makers, following the same routine in different laboratories and countries, could produce samples of indistinguishable activity. Nevertheless, applications have been made from different countries for samples of a central standard, and I have now obtained a quantity of some 50 grammes of the posterior lobe substance, extracted and dried with great care according to the U.S.P. method, and shall be able to meet requests of this kind.

3. *Digitalis, etc.*

The work on the three samples of digitalis powders, distributed for independent essay in different centres, is now practically complete. The results show that the different biological methods available (frog, cat, etc.) give results sufficiently concordant with one another, and with the clinical trials carried out with the same three digitalis powders, to justify the conclusion that the biological methods in use give a true and practical measure of the potency of these preparations. The preparation of the standard digitalis powder by Professor Magnus is now completed, and it is now being packed for distribution. A report showing the applicability of the same methods to strephanthus preparations, with g. strophanthin as a standard, has been received from Dr. Burn and Dr. Trevan.

4. *Salvarsan, etc.*

Samples of one of the standards which Professor Kolle is preparing — that of Neo-salvarsan — have been received and have been distributed for trial and report to several countries. The standard material prepared for the sulpharsenol (sulphars-phenamine) products has been received from Professor Voegtlin and will be distributed similarly for international trial, with the standards for old salvarsan, silver salvarsan, etc., as soon as these are available.

5. *Vitamin A.*

The scheme for comparing a series of cod-liver oils for their content of Vitamin A by the animal test on the one hand and a suggested colour-reaction on the other has been carried out. Professor Poulsson furnished a series of samples of cod-liver oil, and the tests on these by four independent biological experts, and by the colour-reaction, are nearing completion.

ANNEX 117.

REPORT OF THE CANCER COMMISSION.

Statement by the Chairman of the Commission.

Geneva, October 15th, 1926.

The report which the Cancer Commission can submit to the Health Committee at this ssion is only a statement of progress made and of the position of various enquiries and ports which have just been considered by the Commission and by its Statistical Sub-)mmittee at sessions which only terminated last night.

The principal matters which have been under consideration by the Cancer Commission d its Statistical Sub-Committee are as follows :

1. Comparative enquiries as to the incidence and prevention of mortality from cancer the breast and uterus in England, the Netherlands and Italy, the primary investigation trusted to us.

The principal results of these enquiries have already appeared in printed reports submitted the Health Committee. There is nothing to add to the demographic investigation rela-ıg to all three countries as well as to Switzerland and other regions. As regards what have termed the "clinical" enquiry, we have some valuable supplementary information.

In the first place, we have had a summary of the work done to date in England on the bject of uterine cancer, work designed to establish a measure of the present position of :atment, operative and radiological, which can prevent mortality from cancer of this organ its different forms. This is a most important estimation. If, in present knowledge, good dwifery, in the first place, and appropriate treatment of early cancer when it appears, the next place, are the most effective means of reducing suffering and death from cancer, en we have a very definite need of some estimate of the present position of both these :asures, so as to have a basis for comparison in future years when these things are better ne than they are now. Nothing is more important, with a disease which causes such :at mortality, than to know what we are effecting with the means already at our disposal reducing it.

Then, in the second place, we have had additional and most valuable contributions)m the Dutch and from the Italian groups. The additional clinical and pathological results ll be summarised in appendices to the Commission's report, which, if it cannot be in the nds of the Health Committee before the end of the session, will be sent to the members, trust, in a few weeks. They include an account of the preliminary analysis of a mass of ormation supplied by Dr. Lutrario as a result of the examination of the questionnaire in ıly — data which are necessary to the Commission in order to fulfil its original task, and ıich will before long be ready for more complete study and comparison with the Dutch and ıglish data on which you already have reports.

2. Turning now to the enquiries which were based on the question of race predis-sition to cancer, I must refer to the position of the investigations with the object of com-ring cancer mortality in certain countries of Europe with anthropological differences. a previous session I explained the purpose of these studies. They have been undertaken Professor Niceforo and Professor Pittard, each for certain groups of countries in Europe, consultation with the Statistical Sub-Committee. The results of this considerable work now in proof, and the Commission has recommended them for publication. The mmission also recommends that steps should be taken to publish later a valuable monograph cancer mortality in Japan, received from our friend Dr. Kusama.

3. The reliability and significance of statistical data of mortality in relation to cancer ve been receiving much attention on different sides. The Cancer Commission and the Sta-tical Sub-Committee have given much attention to studies on this subject furnished by . Carrière, Dr. Greenwood, Professor Methorst and the Secretariat. Moreover, reports certain national enquiries and statistics have been received and collated by the Secretariat. ıe careful consideration which has been given to this mass of data has enabled a selection be made of certain reports and memoranda on statistical questions, which are ready to be epared for publication.

Nothing is more easy than to assert that there are so many uncertainties in statistics cancer mortality that all investigations based on them are futile. Nothing is more easy, ıin, than to accept a mass of cancer statistics at their face value and to draw facile conclusions ıich suit one or another preconceived theory of the causes of cancer. The task of our experts s been to examine impartially the probable extent and significance of the errors which arise

from different circumstances. It is new work, and again, I venture to say, work which wil be invaluable not only for present purposes but for reference in the future when the progres made has to be judged by comparison with previous years.

* * *

With the completion of the supplementary data, the circulation of the Commission's report on the meetings just concluded, and the issue of the two or three reports which we propose should be printed, the Commission will have reached, in the early months of nex year, for example, something like an end to the work which it considers can profitably be done under the programme to which it has been working hitherto. We had hopes at the beginning that the problem of the differences between the three countries in the matter o the mortality from cancer of the breast and uterus would have proved capable of solution In one sense, it might have been satisfactory to have produced a demonstration that these differences were a mere caprice of death certification, or represented demographical differences or differences which resulted from better clinical diagnosis and earlier operative treatment in one country as compared with another. If no such explanation is forthcoming, the faithfu pursuit of our programme has had its compensations. In pursuing it, we have not merely established a series of negatives, useful and necessary as they are. The positive achievements have been considerable. I have only to mention the establishment of the facts, on a wide basis of observation on all three countries, regarding the amount of mortality from cancer of the breast which can be prevented ; the determination of the mean natural duration of life from untreated cancer ; and the stimulus given by our enquiry to national cancer investigations in several countries.

The Commission, when appointed, was authorised to undertake further enquiries into the epidemiology of cancer as circumstances permitted. We are of opinion that, on the completion of our programme, it will be right and necessary that, with the aid of the expert workers to whom we owe so much, the Commission should give full consideration to the possibilities of a well-defined programme of work in new directions — a programme, it will be understood, which fulfils the requirements of our original programme by the fact that it relates to work which only an international body of authority such as the Health Organisation of the League could get undertaken. In proposing that a further programme should be carefully considered and submitted to the judgment of the Health Committee, we have particularly in mind the fact that the existence of large local regional differences in cancer mortality is an important fact which we have found to be almost a general and universal phenomenon, for which no explanation limited to the causes of any one form of cancer can be adequate. If the Committee agrees, therefore, we would propose to concentrate our attention on the completion of the work still in hand during the next few months and thereafter to submit to you material on which to decide upon the next step to be taken.

ANNEX 118.

C. H. 511.

A SUGGESTED PROGRAMME FOR THE STUDY OF SCHOOL HYGIENE.

BY Dr. M. TSURUMI.

At the fifth session of the Health Committee, I had the honour to present a proposal on the study of school hygiene, which was received with sympathetic interest.

However, owing to the pressure of work at the last session of the Committee, I could not find time to present my report.

A memorandum on this subject has been prepared for me by many American authorities who have stated their willingness to co-operate with us, and to whom I take this opportunity of expressing my appreciation.

I have utilised this memorandum in the preparation of the following suggestions, which I have the honour to present for your consideration.

General Principles.

The aim and object of school hygiene should be not only to maintain health but also to promote it.

The health of school-children is a primary obligation in education, and measures for the promotion of the health of the school-child should be regarded as a public duty.

Such health is to be interpreted in terms not only of physical well-being but also of the child and his whole nature.

In the present enquiry, this principle must be kept in mind and an endeavour made to determine how best to achieve this end.

In my opinion, the enquiry should include the following :

(1) A comparative study of the programmes of school hygiene in different countries and of the results obtained ;

(2) An enquiry on certain special problems related to school hygiene, which I shall discuss later on.

The school health problem, regarded as a whole, is very extensive and complicated. I believe, therefore, it is wise to restrict the preliminary study to general matters and to some specially important questions.

I should also like to propose to limit the present enquiry to the pre-primary (kindergarten) and primary schools, for the sake of facilitating our work.

In my opinion, the school health problem is made up of three elements, that is :

(1) Health education ;

(2) Practice ;

(3) Investigation.

1. *Health Education.*

The essential aim of health education should be the formation of good habits among school-children by teaching personal hygiene and public health.

Since the formation of health habits in the child is largely dependent on impressions acquired at an early age, it is highly desirable that all health teaching, especially in the lower grades, should emphasise the positive aspect, stressing health in terms of beauty, strength and joy.

Believing that health habits must be inculcated at an early age as an integral part of all education, I strongly urge that all the activities of the school day be utilised towards this end.

Since a knowledge of facts is necessary not only for intelligent practice of personal health habits but also as a preparation for civic responsibility in later years, the scientific facts about health should be taught in relation with many other school subjects. This aspect of health education should be emphasised in the upper grades.

It is necessary for national health authorities to formulate minimum essentials with regard to health practices. These will vary with national conditions. Such essentials may well take the form of a simple set of rules which can be readily understood by any normal child.

Effective ideals or healthy living must be established in the minds of all children based on these minimum essentials, and consistent with the best national customs.

The habitual practice of healthy habits, based on the minimum essentials of health practice in accord with national ideals, must be developed systematically.

It seems to me, moreover, indispensable to insert health chapters in the school reading-books.

The realisation of the school-health programme will require teachers who can appreciate this type of education, who have a knowledge of the subject-matter and who possess skill in using effective methods for educating the child along these lines. This will necessitate a distinct type of training for teachers, with emphasis on the development of personal health standards and practices among prospective teachers and the provision of opportunities for actual experience in training children in this field. It is obvious that both teacher and pupil should regard health not as an end in itself but as an important means of making life fuller, happier and richer.

2. *Practice of School Hygiene.*

This implies control of the most effective means of promoting the well-being of the child through medical services, services founded on the best professional standards in any given nations. Realising that this field is still in a pioneer stage of development throughout the world, new standards must be established and new techniques used embodying the results of co-operation between the authorities of different countries.

The activities involved in the practice of school hygiene are so numerous that some discrimination is necessary in order to avoid overtaxing our resources.

I therefore suggest that the Committee restrict the preliminary enquiries to a comparative study of the programmes of school hygiene in various countries and of the results obtained. Attention might be paid to the following fundamentals :

Physical Development.

It is essential to study the physical development of school-children.
This study should include :

(1) Measurement at least quarterly of:

(*a*) Body weight,
(*b*) Height,
(*c*) Thorax.

(2) Relation of age to variations in the physical development ;

(3) Conditions which have an influence on the physical development — for instance seasons, home environment, etc. ;

(4) Influence of open-air schools, summer colonies, etc.

For the standard of measurement I should like to propose the use of the metric system in order to facilitate comparative studies.

To ensure correctness of statistics, it is also necessary to unify the methods of physical examination as far as possible.

Vital Statistics.

In order to ascertain the health conditions of school-children, vital statistics must not be neglected, and data on the following subjects should be collected :

(1) Relation between the school year and sickness and between season and sickness ;

(2) Mortality of school-children by age and cause ;

(3) Preventive measures and treatment of diseases in schools.

The last item is particularly important from the point of view of the campaign against tuberculosis. As for the other infectious diseases, a beginning might be made by collecting reports from countries where large numbers of children have been immunised against scarlet fever, diphtheria and measles, although the most valuable work in this direction has been directed towards protecting children below school age.

3. *Investigations.*

These should include all measures for the control of school environment in its relation to the healthy development of the child while in school which are intended to secure the best facilities and the best use of such facilities for the development and growth of the child. For instance :

(1) Air conditions ;

(2) Light ;

(3) Freedom of movement ;

(4) Relaxation ;

(5) Balance of work and rest periods ;

(6) Food needs of the child in school ;

(7) Cleanliness.

As regards food needs of the child in school, some attention should be paid to methods of estimating and recording the state of nutrition. Arbitrary statements such as "well nourished", "badly nourished", etc., do not lend themselves to comparative studies. The various standardised tables of weight and height in relation to age, of which the Pirquet and Schick system (1917) is an example, represent an important advance in this direction. It would be of interest to know whether these are of practical value.

I should like to present later a report on my studies of this problem among primary school-children in Manchuria. The problem of abnormal constitutions and their relation to such diseases as tuberculosis is also of considerable interest, and I should like to present some observations on this point at a subsequent session.

I have been delighted to learn of the interest of various delegations to the seventh ordinary session of the Assembly in the subjects of physical education and nutrition. The study of these proposals may well be linked up with the examination of international problems in school hygiene. I therefore have the honour to move the adoption of the following resolution :

"The Health Committee,

"In view of the interest there would be in a study of school hygiene, and the great importance and value of this modern health activity :

"Decides to instruct the Medical Director to collect information for a comparative study of school health programmes and for the study of certain special problems of school hygiene, such as nutrition and recent experience in the prevention of certain infectious diseases, for report to a subsequent session."

ANNEX 119.

C. H. 506.

NOTES ON INFORMATION CONCERNING TRACHOMA COLLECTED FROM VARIOUS COUNTRIES.

BY Dr. ALB. LUTRARIO.

As was stated in the preceding provisional report, the information concerning trachoma llected from the twenty following States : France, Netherlands, Germany, Sweden, Finland, stonia, Latvia, Poland, Russia, Czechoslovakia, Hungary, Austria, Roumania, Greece, e Kingdom of the Serbs, Croats and Slovenes, Italy, Spain, Japan, Canada, United States of merica, varies considerably. Some countries have sent very detailed information, whereas e data sent by others are incomplete, so that it is impossible to establish any comparison tween the various countries.

It would therefore be necessary to invite these countries to give supplementary information ncerning the following points :

France.

The existence, distribution and working of dispensaries and consulting-rooms for trachoma es, either attached to hospitals or clinics or independent ;

The use of visiting nurses ;

The predominant clinical forms (course of the disease, sequelæ and after-effects as regards acity for work ; approximate number of cases of blindness — total or relative — due to choma) ;

The most recent statistical data concerning the number of cases of trachoma observed the army and navy at the time of conscription or during military service ;

The existence of special schools for trachomatous children and the results obtained in se establishments ;

Special instruction given to doctors — in particular, country doctors — concerning the mpt diagnosis and treatment of the disease ;

The appropriations, if any, provided in the State, departmental or municipal budgets the anti-trachoma campaign ;

Researches carried out with a view to ascertaining the causes of infection and the best thods of prophylaxis and treatment.

Germany.

The most recent statistical data concerning the number of cases of trachoma in the army navy at the time of enrolment or during military service ;

Clinical forms observed (course, sequelæ, and, if possible, indication of cases of blindness total or relative — due to trachoma) ;

Existence of schools for trachomatous children ; special dispensaries or consulting-ns ; visiting nurses ;

Instruction of doctors ;

Appropriations in the State or local budgets for the anti-trachoma campaign ;

Special clinics or hospitals, if any ; methods of propaganda, with special reference to homa.

Housing and living conditions in so far as they may be factors in the spread of the disease ;

Investigation and research concerning the causes of infection and the best methods of phylaxis and treatment ; special institutes dealing with these questions.

Sweden.

Supplementary information concerning localities in which cases of trachoma have been rved, showing the chief causes to which the appearance of the disease may be attributed ;

Inspection, if any, of school-children, and most recent results obtained ;

Any laws, regulations or other provisions concerning the anti-trachoma campaign.

Latvia.

Compulsory notification of trachoma in isolated cases or in certain determined cases or ps of the population ;

Regular inspection, if any, of school-children, and most recent results obtained ;

Dispensaries or consulting-rooms for trachomatous cases, and their operation ;

Results of any recent statistical enquiries concerning the number of cases of trachoma observed in Latgalia and concerning housing and living conditions which might be factors in the spread of the disease ;

Health propaganda, and, in particular, anti-trachoma propaganda ;

Special laws and regulations concerning trachoma, and appropriations in the budget for the anti-trachoma campaign.

5. *Estonia.*

Compulsory notification of trachoma ;

Special laws and regulations concerning trachoma, and budget appropriations for the anti-trachoma campaign.

6. *Poland.*

Compulsory notification of trachoma in isolated cases or in certain determined cases and groups ;

Existence, distribution and working of dispensaries or consulting-rooms for trachomatous cases annexed to hospitals and clinics or independent ; service, if any, of visiting nurses ;

Predominant clinical forms (course, sequelæ and after-effects as regards capacity for work; approximate number of cases of blindness — total and relative — due to trachoma) ;

Most recent statistical data concerning the present systematic inspection of children and most recent statistical data concerning cases of trachoma observed in the army at the time of conscription and during military service ;

Special instruction for doctors concerning trachoma ;

Appropriations in State or local budgets for the anti-trachoma campaign ; special laws and regulations concerning the disease ;

Investigations or research regarding the causes of infection and the best methods of prophylaxis and treatment.

7. *Russia.*

Compulsory notification of trachoma in the various territories ;

Existence of dispensaries or consulting-rooms for trachomatous cases attached to hospitals or clinics, or independent, and their working ;

Special clinics or hospitals ;

Inspection of school-children, if any, and most recent results obtained ;

Housing and living conditions in the various districts in so far as they may be factors in the spread of trachoma ;

Predominant clinical forms (course of the disease, sequelæ and after-effects as regards capacity for work; approximate number of cases of blindness — total or relative — due to trachoma) ;

Most recent statistical data concerning the number of cases of trachoma observed in the army at the time of conscription and during military service ;

Special schools for trachomatous children, and the results obtained in these establishments ;

Special instruction for doctors concerning the prompt diagnosis and treatment of the disease ;

Special laws and regulations concerning the prophylaxis of trachoma, and appropriations in State or local budgets for the anti-trachoma campaign ;

Any investigation and research regarding the causes of infection and the best methods of prophylaxis and treatment.

8. *Czechoslovakia.*

Compulsory declaration of trachoma in isolated cases, as well as in certain determined cases or groups ;

Housing and living conditions in so far as they may be factors in the spread of trachoma ;

Working of the anti-trachoma dispensaries ;

Predominant clinical forms (course, consequences, number of cases of blindness due to trachoma) ;

Most recent statistical data concerning cases of trachoma observed in the army at the time of conscription and during military service ;

Special instruction for doctors and methods of anti-trachoma propaganda ;

Investigations and research regarding causes of infection and the best methods of prophylaxis and treatment ; special institutes dealing with these questions.

9. *Hungary.*

Existence, distribution and working of dispensaries and consulting-rooms for trachomatous cases, attached to hospitals or clinics, or independent ;

Present incidence of trachoma in the country, and predominant clinical forms (course, sequelæ and after-effects as regards capacity for work; approximate number of cases of blindness — total or relative — due to trachoma) ;

Statistical data concerning cases of trachoma observed amongst school-children and in other groups (army, etc.) ;

Appropriations in the State budget for the anti-trachoma campaign ;

Organisation of special courses for doctors (programme, etc.) ;

Investigations and research regarding the causes of infection and the best methods of prophylaxis and treatment.

10. *Austria.*

Compulsory declaration of trachoma in isolated cases or in certain determined cases or groups ;

Present distribution of trachoma in the country, and predominant clinical forms (course, sequelæ and after-effects as regards capacity for work ; approximate number of cases of blindness — total or relative — due to trachoma) ;

Existence, distribution and working of dispensaries and consulting-rooms for trachomatous cases attached to hospitals or clinics, or independent ;

Most recent statistical data concerning causes of trachoma observed in schools or other groups (army, etc.) ;

Appropriations in the State budget for the anti-trachoma campaign ;

Special instruction for doctors concerning the prompt diagnosis and treatment of the disease ;

Investigations or research with a view to ascertaining the ætiology and prophylaxis of the disease.

11. *Roumania and Greece.*

Compulsory notification of trachoma ;

Present incidence of trachoma in the two countries, and predominant clinical forms course, sequelæ and after-effects as regards capacity for work; approximate number of cases of total or relative blindness due to trachoma) ;

Most recent statistical data concerning cases of trachoma observed in schools and other groups (army, etc.) ;

Local factors (customs, housing and living conditions, etc.) likely to favour the spread of the disease in Roumania and Greece ;

Appropriations in the State or local budgets for the anti-trachoma campaign ;

Laws and regulations concerning the prophylaxis of trachoma ;

Organisation of final courses for doctors and of anti-trachoma propaganda.

12. *Kingdom of the Serbs, Croats and Slovenes.*

Compulsory notification of trachoma ;

Present incidence and distribution of the disease in the country, and the predominant clinical forms, course and sequelæ ;

Working of recently created anti-trachoma stations, showing present number of these establishments, their distribution over the territory, number of cases treated and forms observed, etc. ;

Incidence of trachoma in the various groups (schools, army, etc.) ;

Budget appropriations for the anti-trachoma campaign ;

Recent laws and regulations concerning the prophylaxis of trachoma ;

Organisation of final courses for doctors, methods of propaganda, and local factors (customs, housing and living conditions, etc.) which favour the spread of trachoma.

13. *Spain.*

Compulsory notification of trachoma ;

Working of anti-trachoma dispensaries or stations; their number and distribution throughout the country ;

Most recent statistical data concerning the number of cases of trachoma observed among school-children and in other groups (army, etc.) ;

Local factors (customs, living and housing conditions, etc.) likely to favour the spread of trachoma ;

Appropriations in State budget for the anti-trachoma campaign ;

Recent laws and regulations concerning the prophylaxis of trachoma ;

Special instruction for doctors and forms of anti-trachoma propaganda; research regarding the causes of infection and the best methods of prophylaxis and treatment.

14. *Japan.*

Local factors (customs, living and housing conditions, etc.) likely to favour the spread of trachoma ;

Most recent statistical data concerning cases of trachoma observed among school-children and in other groups (army, etc.) ;

Appropriations, if any, in the State budget for the anti-trachoma campaign ;

Incidence of trachoma in the country, and predominant clinical forms, their course and after-effects ;

Organisation of special courses for doctors and methods adopted for anti-trachoma propaganda ;

Research, if any, regarding the causes of infection and the best methods of prophylaxis and treatment.

15. *Canada.*

Compulsory notification of trachoma ;

Present incidence of trachoma in the country and predominant clinical forms, showing their course and after-effects ;

Local factors likely to favour the spread of the disease ;

Recent laws and regulations concerning trachoma ;

Most recent statistical data concerning the number of cases observed in schools or other groups of the population.

16. *United States of America.*

Compulsory notification of trachoma in the various States ;

Appropriations, if any, in the budgets of the various States for the anti-trachoma campaign ;

Research regarding the causes of trachoma and the best methods of prophylaxis and treatment.

* * *

In *Italy*, as a result of investigations carried out in schools, highly interesting information has been obtained, supplementing that which has already been supplied in the provisional report (C. H. 459). These particulars are at present only to hand for towns which have established a service of school doctors, and for the provinces in Eastern Sicily. The results of the ophthalmic examinations carried out in the schools during the scholastic year 1925-26 show 5.5 per cent of cases of trachoma among 121,479 pupils examined in 203 communes in Eastern Sicily. The health authorities are at present carrying out a special enquiry with a view to ascertaining the actual incidence of the disease.

During recent years the anti-trachoma campaign has been intensified in the provinces where it is most prevalent by the application of the measures contemplated by the law of June 29th, 1922, which may be summed up as follows :

(1) Grant of advances, free of interest, to welfare societies or institutes, with a view to establishing consulting-rooms and special premises for the treatment of the disease ;

(2) Grants for the equipment and working of these consulting-rooms ;

(3) Grants for the organisation of propaganda by means of theoretical or practical courses of instruction for doctors and for the prophylaxis of trachoma in schools.

The number of public dispensaries (consulting-rooms) for the free treatment of trachoma continues to increase. During 1925, thirty-nine new dispensaries, the majority of which are in Sicily, Sardinia and Apulia, were established with State aid, so that at present there are 196 of these institutions, as compared with 156 in 1924. There are also a large number of consulting-rooms established by communes or other groups and subsidised by them, not counting the general medical and surgical dispensaries which also treat trachoma cases.

Special measures are taken for the prevention of trachoma in schools, and more schools for trachomatous children have been opened. Subsidies have been granted for the equipment and working of schools of this kind, with services for the regular examination of the children's eyes in the provinces of Apulia, Sardinia and Sicily. In places where there are no schools for trachomatous children, regulations have been laid down for the regular examination and ophthalmic treatment of the pupils. Further, with the help of the scholastic authorities, children suffering from diseases of the eyes are more strictly isolated, and the number of special classes for trachomatous children has been increased. In districts where trachoma is very prevalent, sanatoria schools are being established either with a view to the prophylaxis of the disease or for its treatment, with the help of dispensaries attached to the schools.

Seven of these establishments, comprising 24 classes, are working in the province of Syracuse; 4, comprising 7 classes, in the province of Girgenti; and one, comprising 4 classes in the province of Messina.

In 1925, theoretical and practical courses for communal medical officers, public health officers and private practitioners were organised, dealing with the diagnosis, treatment and prophylaxis of trachoma.

Recently, the Italian Ophthalmological Association was created, under the presidency and direction of Professor Cirincione, Senator and Director of the Ophthalmic Clinic at Rome, to promote scientific study and research work concerning diseases of the eye and, more especially, the ætiology, prophylaxis and treatment of trachoma.

To complete the data already collected by the League of Nations, it would be necessary to obtain information concerning trachoma from the following countries :

1. *Europe* :	1. Albania,	8. Irish Free State,
	2. England,	9. Lithuania,
	3. Belgium,	10. Luxemburg,
	4. Bulgaria,	11. Malta,
	5. Denmark,	12. Norway,
	6. Danzig,	13. U.S.S.R.
	7. Finland,	
2. *Africa* :	1. Algiers,	3. Egypt,
	2. Libya (Tripoli and Cyrenaica),	4. Tunis,
		5. Morocco.
3. *America* :	1. Argentine Republic,	6. Mexico,
	2. Brazil,	7. Panama,
	3. Chile,	8. Uruguay,
	4. Costa Rica,	9. Venezuela,
	5. Cuba,	10. Dominican Republic.
4. *Asia* :	1. Cyprus,	4. Dutch East Indies,
	2. Palestine and Syria,	5. French Indo-China,
	3. British Indies,	6. China.
5. *Australia* :	1. Australia,	2. New Zealand.

These States should be invited to supply information not only concerning the prevalence f the disease, its distribution over the territory, its progress during recent years, its gravity, :c., but also concerning any laws and regulations which may have been enacted or circulars hich may have been published by the health authorities regarding the prophylaxis of the isease, and any other information of special interest in connection with this problem, *e.g.*, iformation as to whether the notification of trachoma is compulsory in isolated cases or in rtain determined cases or sections of the population, whether the service of visiting nurses made use of; whether the school-children are regularly examined and with what results; hether dispensaries or consulting-rooms exist for trachomatous cases, either attached to ospitals or independent; whether special clinics or hospitals exist; whether propaganda health matters and, in particular, anti-trachoma propaganda has been organised; formation regarding housing and living conditions in so far as they are factors in the spread

of the disease ; whether country doctors receive special instruction to enable them to diagnose and treat trachoma ; and, finally, what investigations and researches, if any, are being carried out with a view to ascertaining the causes of infection and the best means of preventing and combating the disease.

ANNEX 120.

A. 112. 1926. III.

RESOLUTION ADOPTED BY THE ASSEMBLY AT ITS MEETING HELD ON SEPTEMBER 24TH, 1926 (AFTERNOON), ON THE PROPOSAL OF THE SECOND COMMITTEE.

The Assembly :

Having taken note of the reports dealing with the work of the Health Organisation (documents A.6.1926, A.6 (*a*).1926 and A.17.1926), notes with satisfaction the growth and increasing usefulness of that work with its tendency to universality ;

Expresses its gratification at the work undertaken and the results obtained by the Health Committee and its organs as well as by the various experts entrusted with special missions, and wishes to express its sympathetic interest with the scientists of the International Commission on Sleeping-Sickness who are conducting their sometimes dangerous enquiry in Equatorial Africa.

The Assembly notes with satisfaction the close collaboration established with the sanitary and medical authorities of Japan as a result of the interchange and the conferences held in that country ; and with the sanitary administrations of other Far-Eastern countries, through the intermediary of the Advisory Council of the Epidemiological Intelligence Bureau of the League at Singapore ;

Notes, in particular, the plan of research work and special enquiries into health problems of the Far East in which the administrations of British India, China, the Dutch Indies, French Indo-China, Japan, the Philippine Islands and Siam have promised their assistance ;

And requests the Council to refer the resolutions proposed by the Cuban [1], Czechoslovak [2] and Uruguayan [3] delegations to the Health Committee for consideration.

A. 112 (a). 1926. IV.

SECOND RESOLUTION ADOPTED BY THE ASSEMBLY AT ITS MEETING HELD ON SEPTEMBER 24TH, 1926 (AFTERNOON), ON THE PROPOSAL OF THE SECOND COMMITTEE [4].

The Assembly,

In view of the importance of the work of the Singapore Bureau of Epidemiological Intelligence as the first institution of the League of Nations in the Far East, and in view of the utility of its work not only for the Far-Eastern countries but also for other States Members of the League :

Decides that provision for the expenses of the Bureau should be made in the Budget of the League for 1927.

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[1] The Second Committee, in conformity with the resolutions adopted by the Assembly at its fifth and sixth ordinary sessions on the subject of infant mortality and the protection of children, requests the Council to ask the Health Committee to consider to what extent it could, at a suitable time, enlarge its scheme of international enquiry to include other problems of eugenics.

[2] The Second Committee, considering the importance of physical culture as a means for preventing disease, and in view of the interest which numerous countries take in that question, asks the Council to instruct the Health Committee to consider the inclusion in the programme of its work of the international investigation of physical culture, including scholastic hygiene, and to decide what special problems may necessitate a comparative study and a co-ordination of national research work and national enquiries.

[3] The Second Committee, having taken note that the International Economic Conference's plan of enquiry is to include an examination of the problem of nutrition (document A. 24. 1926. II), points out the interest which would attach to the supplementing of this enquiry by a study of the problem from the standpoint of race improvement. This study should take into account the work of the Health Organisation regarding infant mortality, as well as the reports by the Japanese Institute of Research into Nutrition Problems comprised in the publications of the Health Committee.

[4] See document A. 112. 1926. III.

C. 585. 1926. III.
[C. H. 518.]

ANNEX 121.

REPORT ON THE WORK OF THE EIGHTH SESSION OF THE HEALTH COMMITTEE.

Approved by the Council on December 6th, 1926.

I.

The Health Committee considered the report of the Permanent Standards Commission (C.H. 517) and the Chairman's description of the work accomplished by this Commission during its session of October 11th, 12th and 13th, 1926. The following resolution was adopted:

" The Health Committee takes note of the report of the Permanent Standards Commission, including the work of the Sub-Committees for the study of anti-dysenteric and anti-tetanic sera."

II.

The interim report of the Sleeping-Sickness Commission (C.H. 505), outlining the work already accomplished by the experts assembled at Entebbe, on Lake Victoria, Uganda, and recommending an extension of six months in addition to the twelve-months period of work as originally recommended by the London Conference, was considered by the Health Committee.

The Health Committee was of the opinion that it would be desirable for the Commission to prolong its work for this additional period, and accordingly adopted the following resolution:

" The Committee accepts the interim report of Dr. Duke of August 3rd, 1926, regarding the progress made by the expert mission on sleeping-sickness established at Entebbe, and associates itself with the appreciation of this work which was expressed in the resolutions of the Assembly of September 24th, 1926.

" The Committee approves the proposal that the work of this mission should be prolonged for approximately six months beyond the term of twelve months originally proposed by the London Conference, and recommends that, should it be necessary, communications should be addressed from the League to the Governments participating in the enquiry to invite the contribution of additional funds for this purpose."

III.

The Health Committee took note of the suggestions made to them in regard to the desirability of informing a larger number of public health officers, and others who might be interested, concerning the work of the Health Organisation. After discussion, the Committee expressed its views as follows:

" The Health Committee instructs the Medical Director to prepare a memorandum on methods of disseminating more widely information in regard to the work and publications of the Health Organisation."

IV.

The Chairman, on behalf of the Cancer Commission, made a statement on the work accomplished since the enquiry was initiated by the Health Committee, with special regard to reports presented to the Commission during its session of October 1926. After an exchange of views, the Health Committee adopted the following resolution:

" The Health Committee:

" Takes note of the Chairman's statement with regard to the work of the Cancer Commission in relation to the reports on the geographical and racial distribution of cancer mortality;

" Desires to associate itself with the Commission in its expression of gratitude to the experts who have contributed so much to the success of this enquiry; and

" Requests the Commission, after the current reports and enquiries have been completed, to prepare for a subsequent session a résumé of the work already accomplished, together with their proposals for further study."

V.

The Chairman of the Malaria Commission made a statement on the progress of the work in 1926, referring to the study tours, field and laboratory studies, and the malaria courses. The Health Committee adopted the following resolution, presented by the Chairman on behalf of the Malaria Commission:

" The Health Committee decides:

" 1. To extend the study tours of the Malaria Commission to some extra-European countries where malaria prevails, postponing to a future date the selection of those countries to be studied in 1927.

" 2. To continue the studies undertaken by the Commission and by certain of its members on:

" (*a*) The problem of deltas (already begun on the deltas of the Danube, the Ebro and the Pô);

" (*b*) The effect of major sanitary measures, especially in Italy and Holland;

" (*c*) The laboratory problems described in the resolutions adopted by the Committee during the October 1925 session;

" (*d*) The relations between certain meteorological conditions and the prevalence of malaria.

" 3. To continue the study of the secondary alkaloids of cinchona, as well as of hydroquinine and cuprein derivatives, in order to complete the preparatory measures for an international conference on this subject.

" 4. To repeat in 1927 the malaria courses at the Institutes of Tropical Medicine at Hamburg, London and Paris, followed by the practical stage in countries where malaria prevails."

VI.

The Health Committee considered the report of the Medical Director on the work undertaken to give effect to a resolution adopted at a previous session in regard to the forthcoming revision of the International List of Causes of Death. After careful examination the following resolution was adopted:

" The Health Committee,

" Having considered the report of the Medical Director on the List of Causes of Death, the correspondence on this subject with the International Institute of Statistics and the observations made during the discussions in the Committee,

" Decides:

" (*a*) To entrust to a committee of experts the study of the documents transmitted to the Health Section by the Governments which comply with its request and of the preparatory work incident to the revision of the nomenclature now in use;

" (*b*) To keep the International Institute of Statistics in touch with the work of the committee of experts and, when the moment appears opportune, to convoke a preparatory conference of the committee of experts and a delegation from the Institute in order to secure agreement on the questions which will be submitted to the future international conference."

VII.

The Chairman of the Smallpox and Vaccination Commission outlined the progress of the enquiry, including the laboratory and field studies in the countries concerned.

The Health Committee decided to request the Commission to meet at an early date with such experts as are at this stage in its judgment necessary for the purpose of preparing a progress report.

VIII.

The proposal of Dr. Tsurumi in regard to school hygiene was presented to the Health Committee, which decided to proceed accordingly and adopted the following resolution:

"The Health Committee:

"Decides to instruct the Medical Director to collect information for a comparative study of school health programmes and regulations and for the study of certain special problems of school hygiene such as nutrition of school-children and recent experience in the prevention of certain infectious school diseases, for report to a subsequent session."

IX.

The Health Committee considered the report of the Conference of Child Welfare Health Experts (C.H. 507), together with the proposals for the study of certain subjects relating to child hygiene and infant mortality. The following resolution was adopted:

"The Health Committee:

" Expresses its appreciation of the work of the Conference of experts and approves the proposals for investigations contained in its report;

" Decides to invite experts from South American countries to participate in the studies proposed by the Conference, and to convene these experts in a Latin-American country to examine and present a report on the results of their studies."

X.

The Health Committee adopted the report of the Medical Director on the work accomplished since the sixth session (May-October 1926).

XI.

The Health Committee considered the resolution relating to the study of eugenics presented the seventh ordinary session of the Assembly by the Cuban delegation (A. 112. 1926. III) and decided that the present moment was not opportune to propose an enquiry on this subject.

XII.

The Health Committee, having considered the resolution relating to physical education presented the seventh ordinary session of the Assembly by the delegation of Czechoslovakia (A. 112. 1926.), decided as follows:

" The Health Committee requests the Medical Director, in consultation with experts in physical education and after consultation with the health authorities of Czechoslovakia, to prepare a report on this subject for a subsequent session."

XIII.

The Health Committee considered the resolution in regard to the problem of nutrition presented to the seventh ordinary session of the Assembly by the delegation of Uruguay and, while realising the international importance that a study of this nature would have, decided to postpone more detailed consideration to a subsequent session.

XIV.

" The Health Committee,

" Having taken note of the second provisional report on trachoma,

" Decides to continue the enquiry along the lines indicated in that report. "

XV.

" The Health Committee,

" In view of the stipulation contained in the agreement with the Office international d'hygiène publique which governs the Health Organisation of the League of Nations, and

" In view of the convenience there would be in making proposals to the Council of the League of Nations at an early date regarding the nomination of members to be appointed by the Council:

" Decides to authorise the Bureau to make the necessary proposals regarding the nomination of members of the Health Committee to be selected by the Council of the League of Nations."

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